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Mathematicks made Easie:
Or a compleat Mathematical
DICTIONARY,
EXPLAINING

All the Parts of the Mathematicks, with all the
Terms of Art, and difficult Phrases rendred
plain and easie to every Capacity.

COLLECTED

From Monsieur *Ozanam's Dictionnaire Mathema-
matique, Vitalis*, and others; with an Appen-
dix containing the Quantities of all sorts of
Weights and Measures, the Characters and
meaning of the Marks and Symbols, or Ab-
breviations commonly used in *Algebra*.

A L S O

The Definition, Explanation, Nature and Mean-
ing of the principal Mathematical Instruments,
illustrated on Copper Cuts curiously Engra-
ven.

By *J. Moxon* at the Atlas in *Warwick-lane*, and *Tho.
Tuttel* Mathematical Instrument-maker to the King's
most Excellent Majesty, at the King's Arms and
Globe at *Charing-Cross*, and against the Royal Ex-
change in *Cornhil*.

L O N D O N:

Printed for *W. Hawes* at the Rose in *Ludgate-
street*. MDCCI.

1701

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ALSO

The Definition, Explanation, Names and Meanings
of the principal Mathematical Instruments,
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By J. Moxon at the Atlas in the Strand, and T. B. ...
Printed for W. Bland at the Rose in ...
LONDON.





READER.

TO Expatiate in Encomiums, on the Mathematicks, were to Gild Gold; an Undertaking vain and impertinent. This sort of Learning has sufficiently justified its Excellency, both from the certainty of its Principles, and usefulness of its Practice, to all Ingenious Men.

Nor had the Numbers of its Votaries been so few as they are, had not the difficulty of Terms, some *Arabick* most *Greek*, and divers of them *Latin*, according as they have been derived to us from the most Learned of those respective

To the Reader.

Active Nations, in several Ages, deterr'd many of great Natural parts from wading into its Mysteries, or at least clouded its ravishing Beauties from their Eyes.

To remedy this, and at once promote such Praise-worthy and advantageous Arts, and serve the young Students therein, we have taken pains to Collect and Explain the hard Words, Difficult Terms, and Abstruse Phrases, used by Authors, in all the Mathematical Sciences, and Branches depending thereupon, than which nothing hitherto has more discouraged hopeful Tyro's from Proficiency.

But here is offer'd them a Key, that will open to them the Choicest Treasures of *Urania*, and her Sublunary Handmaids: Nay, we have taken care to demonstrate the Nature of the things, as well as genuine

To the Reader.

ruine sense of the Words; and to rivet them in the Understanding, have accommodated the senses with Demonstrated Diagrams, where they are requisite.

If any useful Terms have escaped our diligence, let the Reader consider the Nature of the Work, and that we were forced to trace an almost untrodden Path.

If any Errors have been committed in the Interpretation (as who in such Variety dare pretend to a full and perfect Understanding how, and in what sense every Author hath used a Word) let Imbecility of Judgment, or Defect of Memory be pardoned, but zealous good will for propagating of Arts be encouraged, which was never more cordially designed than in this Work: but the performance is submitted

To the Reader.

mitted to the Charity of thy Censure.

A main thing which induced to this Undertaking, was from Experience, how much such a Work was wanting, and the Canded acceptance of the Two last Impressions, has given a further Encouragement to add the Explanation, Nature, and Meaning, of the chief Instruments used in every part of Mathematicks (also Alphabetically disposed) with a draught of each Instrument curiously drawn upon copper Plates, at the latter end of this Book. We thought it most convenient to place the Definition of the Instruments together by themselves, and we have noted by this Asterick, * what Instruments have been in some measure, explained with their Terms of Art.

Having given thee this Account,
it

To the Reader.

it only remains to advertise thee; a word or two for thy better apprehension of the scope of the Book.

First, Consider, 'Tis intended for Beginners, not Accomplish'd Artists, therefore adapted to the meanest Capacities; preferring sometimes a Plain, Familiar, and Intelligible Description, before a Rigid, Abstruse (though Exact) Definition: Nay, rather (though rarely) venturing upon a Repetition, than running the hazard of not being understood.

Secondly, Observe, We have in most places hinted the Derivation of the Word, which both assists the Memory, and informs the Understanding: yet have put the *Greek* words in *English* Characters; for those that understand *Greek* know them well enough; but those

To the Reader.

those that do not, could not perhaps have read them otherwise, so much as to have perceived any Analogy between them and the Words we say owe their Original to them.

Thirdly, The Letter *G.* or sometimes *Gr.* shows the Word Originally *Greek*; and *L.* or *Lat.* *Latin*. And what is included between these two [] Crotchets, is the natural, strict, and proper Signification of the Word; what follows in the Mathematical acception: and in that where we have been forc'd to use any hard Word, we have explained it by another Synonymous (of the same signification) in a Parenthesis immediately following. Vale.

TO THE
READER.

OUR Design here is not to shew the strict Definition or Derivation of the Name of every Instrument, because most of them are already explain'd; but to give you a brief account of the general Meaning and Signification of the Instrument it Self, with the advantage of every Improvement.

Not that so small a Tract as this can contain their particular Uses, but perhaps may stir up some of greater abilities, and much more leisure to treat severally of the Uses of each Instrument, which will find a thankful Reception to all Practitioners.

We

To the Reader.

We are here confined to a very narrow Compass, nor would willingly keep you too long in Discourse upon any Instrument, but refer you (for your better Satisfaction) to the Figure it self, and in many Instances where the Instruments are drawn so large by the Authors, we refer you to their particular Books.



VALE.

THE
Description and Explanation
OF

Mathematical Instruments,

Alphabetically disposed as now made with
all their Improvements; wherein the
Nature and Meaning of every Instru-
ment is rendred Plain and Intelligible to
every capacity.

Illustrated with *Copper Cuts* curiously Engraven.

By Tho. Tuttell *Mathematical Instrument-*
maker to the KING'S most Excellent
Majesty, at the King's Arms and Globe
at Charing-Cross, and against the Royal
Exchange in Cornhill, and J. Moxon at
the Atlas in Warwick-Lane.

L O N D O N,

Printed for J. Moxon at the *Atlas* in
Warwick-lane, and Tho. Tuttell at
the *Kings-Arms and Globe* at *Charing-*
Cross, 1701.

100

Illustrated with 100 color photographs.

...and against the Royal ...
...and J. Mosen ...

LOW DRY

the King's-arms and Globe on a wing-
ed wreath, and the Tower at
the base of the shield in the chief in
allusion to the place of the battle in
which the King was slain.

Of the Mathematicks in General, &c. By way of Introduction.

1. **T**HE *Mathematicks* are Sciences, which being founded upon certain *Innate-Principles*, do teach Rightly and Easily to Explicate *Occult Properties*, and Intricate Reasons of *Quantity*.

Or, the *Mathematicks* are Sciences of Quantity, the Foundation of other Arts, preparing the Learner for other parts of *Philosophy*.

2. The *Mathematicks* receive their Denomination from the Greek word *Matthesis*, which signifies *Discipline* and *Doctrine*, and doth not only signifie to Learn and Understand, but also to call to Remembrance the Knowledge of those things which are imprinted in the Mind, that is, a Remembrance raised from *Appearances*; as *Pythagoras* interprets it; or form'd by Knowledge it self, therefore the *Mathematicks* is such a *Doctrine*, whose Knowledge brings

Of the Mathematicks

us to the Remembrance of those *Principles* which are imprinted in our Minds.

3. And they are Arts so called for their Excellency, and this General Name is retained, because these of all *Disciplines* are the most Certain and Accurate, and which do chiefly require the Light and Instruction of a *Teacher*: so that they alone seem worthy of the Name of *Art*, as is testified by *Ramus* in his *Scholarum Mathematicarum*, Lib. 4.

4. Quantity is that whereby any thing is said to be Great, or Many, and is Two-fold; viz. Either continued as *Magnitude*, or *Discrete* as *Multitude*. *Magnitude* is *Continued Quantity*, whose parts are knit together by a *common Term*: *Multitude* or *Number* is the collection of *Units*, and a *Unit* is said to be the Beginning of *Number*. Nay, tis *Number* it self, as most *Mathematicians* affirm, &c. But as to these Matters, and many other things proper to the *Mathematicks*, the Reader may abundantly satisfy himself, if he seriously peruse *Dr. Dee's Mathematical Preface to Euclid's Elements*, and for such as have not that Book, take this Brief Account in General:

5. The Parts of the *Mathematicks* (at least those of most general use) are these which

in General, &c.

which follow, viz. *Arithmetick* and *Geometry*, and these two Parts only are called *Pure Mathematicks*, from whence are deduced many other Branches called *Mixt Mathematicks*, As *Astronomy*, *Geography*, *Algebra*, *Trigonometry*, *Perspective*, which contains *Opticks*, *Catoptricks*, *Dioptricks*, *Musick*, viz. *Harmony* (or the Proportion of Sounds) *Chronology*, *Mechanicks*, *Statics* (or the Art of Ballancing) *Architecture*, *Fortification*, *Navigation*, *Surveying*, *Dyalling*, &c. To which may be added also the Art of *Astrology*, which is grounded on, and depends upon *Astronomy*; *Astronomy* the Mother, and *Astrology* is the Daughter, according to *Kepler*.

6. And now to Inform the young Student what each of these Branches do contain, (1.) *Arithmetick* is the Art of Numbering, or it affords Rules and Directions, diligently to search out the Reason and Use of Numbers. 2. *Geometry* is an Art by which is found out or discovered the Magnitude of things precisely, that nothing may deceive us, by appearing Greater, or Less, or Nearer or Farther off, Higher or Lower than it is, which chiefly conduceth to the measuring Distances, and the Capacity of things, &c. But the word it self imports

Of the Mathematicks

no more than Measuring of the *Earth*, and 'tis said the *Egyptians* were the first Inventers of it.

7. The Terms of Geometry are a *Point*, a *Line*, a *Surface*, a *Term* or *Bound*, an *Angle*, a *Body*, a *Right-Line*, a *Perpendicular*, a *Parallel Line*, a *Tangent*, a *Secant*, a *Chord*, and a *Spiral-Line*, &c. And of *Angles*, there is a *Plain Angle*, a *Rectilineal* or *Right Angle*, an *Obtuse*, an *Acute*, a *Curvilineal* and *Mixt Angle*; also the *Angle of Position*, and a *Solid Angle*.

8. In *Triangle* or *Right Lin'd Figures*, there is the *Scalene*, the *Equilateral*, the *Oxigonal* or *Acute-angled Triangle*, the *Ambligon*, the *Square Figure*, the *Rhomboides*, the *Trapezia* and several *Poligons*, of which *Euclid* is very copious in the *Definitions* to the several Books of his *Elements*; where you may also be Informed of the Nature of several *Bodies*, as the *Pyramide*, the *Prism*, the *Sphere*, *Cylinder*, *Cone*, and such like.

9. *Astronomy* is a Science which teaches how to know the *Stars* and their *Motions*. As also the Motion of the *Planets*: It also shews how to compute the exact time of the *Eclipses* of the *Luminaries*.

10. *Astrology* is an Art that teaches how

in General, &c.

to Predict or Foretell future things by the Motions and Aspects of the Planets.

11. *Dyalling* shews us Rules how to find the Hour of the Day by the Shadow of the Sun upon a Plain in any Position, &c.

12. *Opticks* is a Science of the Sight, and the Eye, which is the Member or Instrument of Seeing, and because we see things sometimes by *Right* or *Direct* Rays; sometimes by *Reflected*, and at other times by *Refracted* Rays, this Science is therefore divided into three parts. The First retains the general Name of *Opticks*, and treats of all that concerns a *Right* and *Direct* Ray. The second is called *Catoptricks*, and treats of *Reflex* Rays; The third is called *Dioptricks*, and handles the Subject of *Refracted* Rays; this Art shews the Reason why things appear to our Eyes sometimes Bigger, sometimes Less, sometimes more Distinct, sometimes more Confused, sometimes farther Distant, sometimes Nearer: This Science gives a Reason why some cannot see, but very near; and others see not, but at a distance; also why the Eye cannot see it self, and how it comes to pass that our two Eyes see not Two, but One single Object; it also discovers the mistakes of our Sight. This Subject is lately most ex-

Of the Mathematicks

cellently handled by Esq; *Mollineux* in his *Dioptrica Novo*, Printed in *English*, and frequently to be had amongst the Bookfellers of *London*: It is of great use in the making of *Telescopes*, *Spectacles*, *Perspective Glasses*, &c.

13. *Cataptricks* treats of *Reflex Rays* which shews the Rules and Causes of different *Reflexions*, according to the Diversities of Bodies, where they are made. It treats in particular of all sorts of *Looking Glasses*, of Plain, Convex, Concave, *Parabolick*, *Hyperbolick*, *Eliptick*, and of Burning Glasses, &c. Moreover, *Dioptricks* shews the Rules and Reasons of the making of all sorts of *Microscopes* as well as *Perspective Glasses*; as also all such Instruments that serve to Magnifie or Lessen, &c.

14. The *Statick Art* treats of *Weight* and *Poyisure*, as the *Ballance*, the *Beam*, the *Stilliard*, &c.

15. *Architecture* shews us the Art of *Fair Building*, &c. and is copiously handled of late years by many good Authors.

16. *Fortification* informs us how to make *Strong Forts*, both *Offensive* and *Defensive* and of late years it has been much improved in many Places of *Europe*.

17. *Navigation* is well known in this Age, to be the Art which directs the skill

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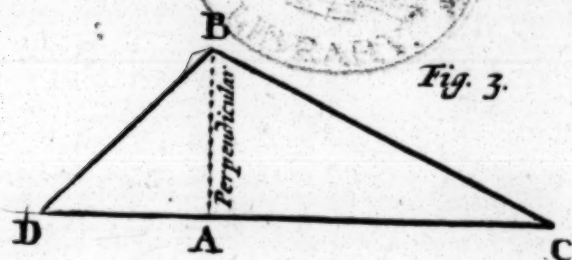


Fig. 4.

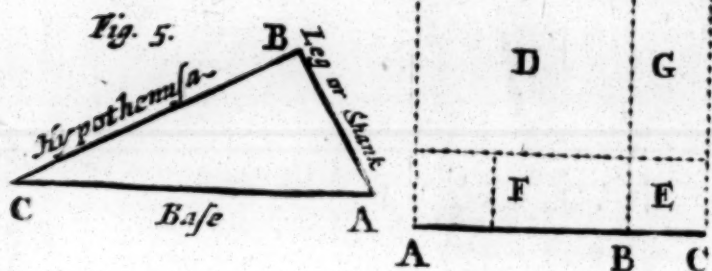
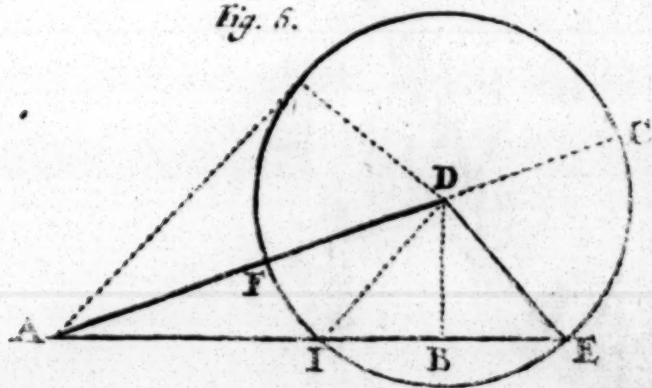


Fig. 6.



in General, &c.

ful *Mariner* how to conduct or carry his *Ship* from one Port to another in any part of the World, of which we have variety of Authors in our English Tongue; and these are some of the most Excellent Uses of the *Mathematical Sciences*.

18. But if the Authors thereof be consulted, you may find almost *Infinite Variety*, and a multitude of Terms appertaining thereunto, some whereof are *Explained* in their *Authors*, and others left to the understanding of the Readers; and for such as are Ignorant in these Matters, this Book was chiefly intended, and tis hoped is now sufficiently Copious, and may prove of Excellent Use for the Industrious Student in these Laudable Arts.

19. *Musick* is a Science appertaining to the *Mathematicks* also, and has its several parts very Copious; but being more for Pleasure and Delight than of real Use, I shall leave it to the Masters thereof.

20. *Chronology* is an Art which gives us an account of *Time*, even from the Beginning of the World; but some Authors that Treat thereof, give us a very uncertain account of its Beginning: However, 'tis a curious Art, and ought to be Encouraged.

Of the Mathematicks, &c.

21. *Geography* is an Art which gives us a Description of the whole World viz. of Sea and Land, in the several particular Parts thereof: But *Cosmography* takes in or includes the whole World both Celestial and Terrestrial: And thus you have a brief Account of the Excellent Use of the several Parts of the *Mathematicks*, which affords as much Delight and Satisfaction to the Industrious Student therein, as all the *Liberal Sciences* taken together, and the Study thereof is no less Profitable than Commendable, and thus much I thought convenient to intimate as a Taste to the young *Tyro*, by way of Introduction.



Mathe-

Mathematical Definitions.

1. Of Lines and Angles.

What Geometry is, has been already defin'd in part, some tell us 'tis the Art of Measuring well: It considers three Principal things that belong to Body, viz. Superficies, Lines and Points, which really signifie the Surface or outside of a Body.

1. **A** Point is no Quantity, but said to be the Bound of a Line.
2. *A Line* is the Bounds or Limits of a Surface or Superficies.
3. *A Surface* is the Bound or Limits of a Body, the first of these has neither Length, nor Breadth, the second has Length without Breadth, and the third, Length and Breadth without Depth.
4. *A Right Line*, is that which lies even between 2 bounded Points.

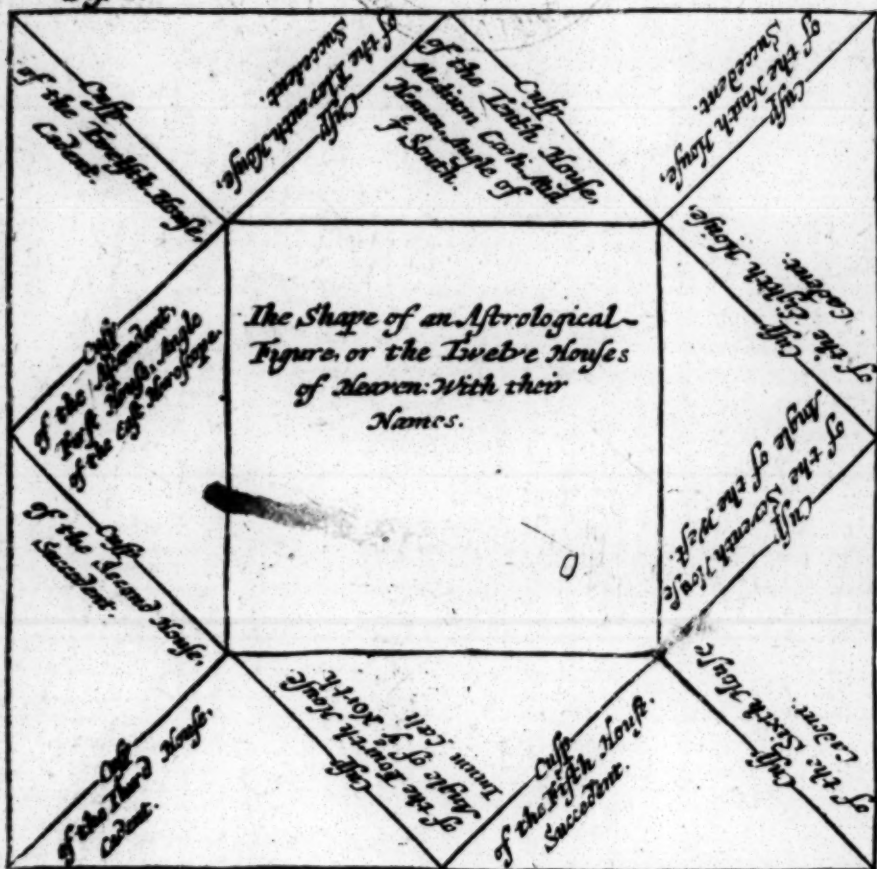
5. *A*

Mathematical Definitions.

5. A *Plain Surface*, is that which lies even between its two Bounding Lines, either as to Length, or Breadth, or both.
6. An *Angle*, is made by the meeting of two Lines, and is either greater or less, as those two Lines either incline or stand farther off, so that if several Lines have the same Inclination, their Angles are said to be Equal.
7. A *Right Angle*, is when one Line so falls upon another, that the Angles on each Side the Perpendicular are Equal.
8. A *Perpendicular*, is when one Line so falls upon another; that both the Angles on each Side are Equal as aforesaid, and are therefore said to be two Right Angles.
9. An *Obtuse* or Blunt Angle, is that which is Bigger than a Right.
10. An *Acute Angle*, is that which is Less than a Right. See the Figures themselves.
11. A *Right Lin'd Angle*, is that which is made between two Right Lines.
12. A *Curv'd Lin'd Angle*, is made of two Crooked Lines, a *mixt Angle* is made by a crooked or arched Line and a streight one. See the Figures at the beginning of the Book for these and the rest, &c.
13. *Parallel Lines*, are those that lean not at all, but if they were extended would never meet.



Fig. 2.



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Mathematical Definitions.

2. Of Figures and Triangles, &c.

14. A *Plain Figure*, is a Plain Figure inclosed, inclosed within one or more Lines.
15. A *Triangle* is bounded, that is bounded with 3 Lines.
16. An *Equilateral* hath all his three Sides Equal.
17. An *Isocles*, or equal Legg'd, which has two Sides Equal.
18. A *Scalene Triangle*, has no Side Equal.
19. A *Right Angled Triangle*, has one Right Angle.
20. An *Acute Angled Triangle*, has all his Angles Acute.
21. An *Obtuse Angled Triangle*, has only one Obtuse or Blunt Angle.
22. A *Parallelogram*, is a four-sided Figure, whose two Opposite Sides are Parallel Lines. See a Scheme of the Figures hereof at the Beginning.

3. Of the Circle.

23. A *Circle*, is a Figure drawn upon a Plane, bounded with one Line, commonly

Mathematical Definitions.

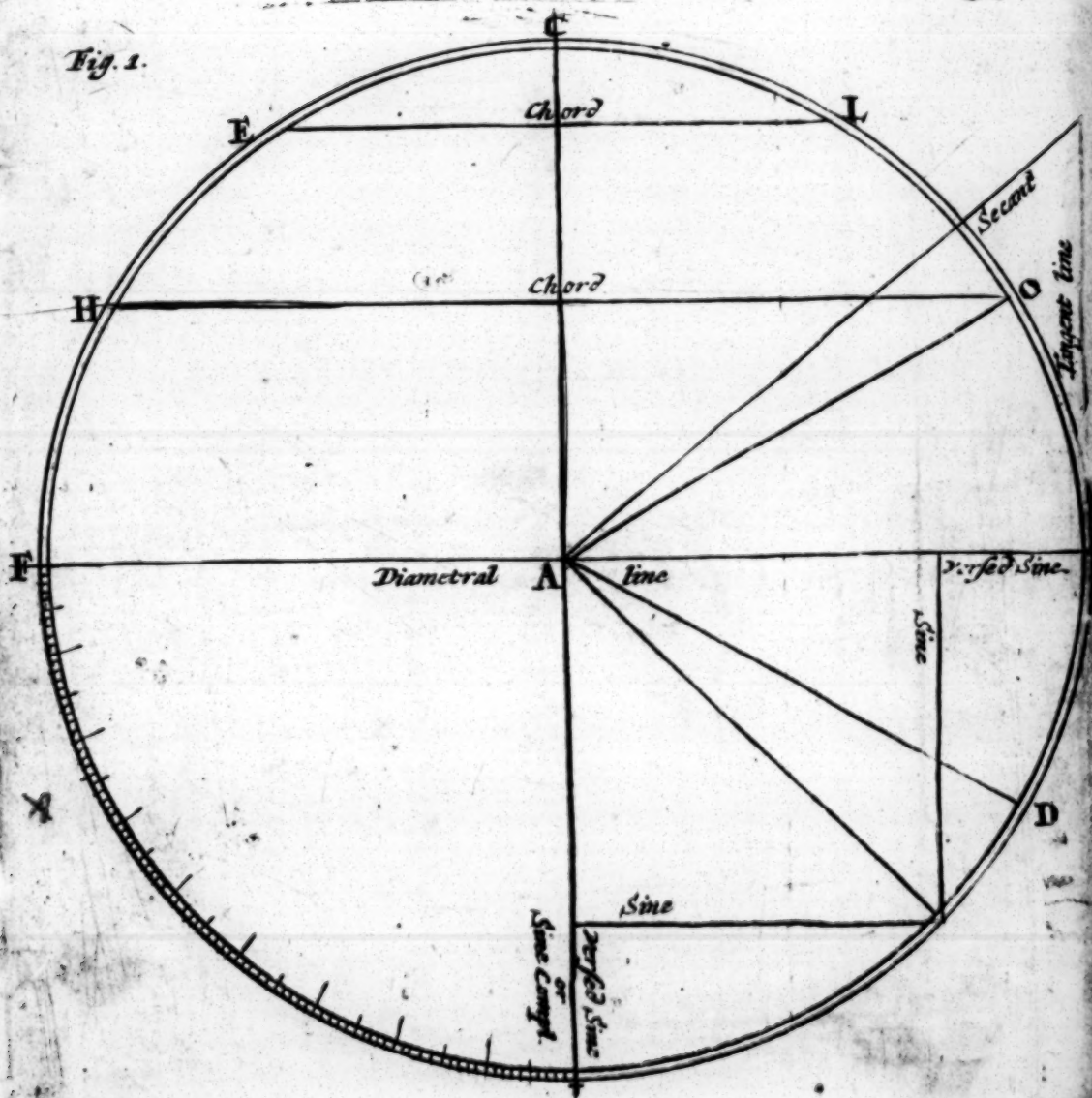
- ly called the Circumference, to which all Lines drawn from the Center are Equal.
24. The *Diameter* of a Circle is a Right Line passing through the Centre, bounded with the Circumference, and divides the Circle into two Equal parts.
25. A *Semicircle*, is half the Circle, or Figure continued between the Diameter and the half of the Circumference.
26. A *Segment* of a Circle, is a Figure contained between a Right Line called a *Chord*, or any part of the Circumference usually called an *Arch*.
27. *Equal Circles*, are such whose Diameters, or Semidiameters (usually called Radius's) are Equal.
28. *Circles* are said to touch, when they do only touch, but not Intersect or cut one another.
29. A *Right Line* is said to touch a *Circle*, when being continued, it does not cut the Circle, and this is a *Tangent Line*.

4. Of Proportion.

30. A *Multiplied Magnitude*, is that which contains another Magnitude, a certain Number of times precisely.



Fig. 1.



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Mathematical Definitions.

31. An *Aliquot*, or simple Part, is that which being Repeated a certain Number of times, is equal unto, or measures out another Magnitude precisely.
32. *Ratio* or Reason, is the Comparison of two Quantities one with another, whereby one is said to be Bigger or Less than another; in which comparison, that which preceeds, is called the *Antecedent*, and the other, the *Consequent*.
33. Those Quantities only admit of Reason, which being multiply'd, may exceed each other.
34. The *Homologous* Terms in any Proportion, are the two *Antecedents*, or the two *Consequents*.
35. *Right Lin'd* Figures, are such as have Equal Angles, and the Sides about those Equal Angles proportional.
36. *Reciprocal* Figures, are, when you compare the Sides of one Figure to the Sides of the other, and the *Antecedents*, and the *Consequents* of the Reasons are in both Figures.
37. A *Rectangle*, is a *Parallelogram*, whose Angles are Right, and a *Square* is a *Rectangle*, that has all its Sides Equal; and these are generally called the Powers of Lines.

Mathematical Definitions.

5. Of Solids, viz. Solid Bodies.

38. A *Solid Angle*, is made by the meeting together of several Plain Angles in one Point or Corner, and of these there must be three at least.
39. A *Solid*, or Body, is that which has Length, Breadth, and Depth.
40. Like *Solid Figures*, are such as are contained under an Equal Number of like Plain Figures.
41. A *Pyramid* is a Solid Figure, whose Sides are Plain Triangles, and their several Tops meeting altogether in a Point.
42. A *Prism* is a Solid Figure, the two Ends (or opposite Sides) of which, are alike, Equal and Parallel, and all the other Sides are *Parallelograms*, as may be seen by the Figure thereof.
43. A *Sphere* is a Solid Figure, bounded with a Surface; to which Superficies all the streight Lines that can be drawn from the Centre Point in the Figure, will be equal.
44. The *Axis* of a Sphere, is that Resting Right Line, about which, if a Semicircle be Turned, it will beget a *Sphere*; and the

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Definitions

A Line

Paralles

A Perpendicular

An Acute Angle

A Right Angle

Ambligon

Oxigon

Scalemum

*Equi:
laterall*

Rhomboides Rhombus

A Long Square

Square

Octogone

Heptagon

Hexagon

Pentagon

A Par

A Prism

A Cube

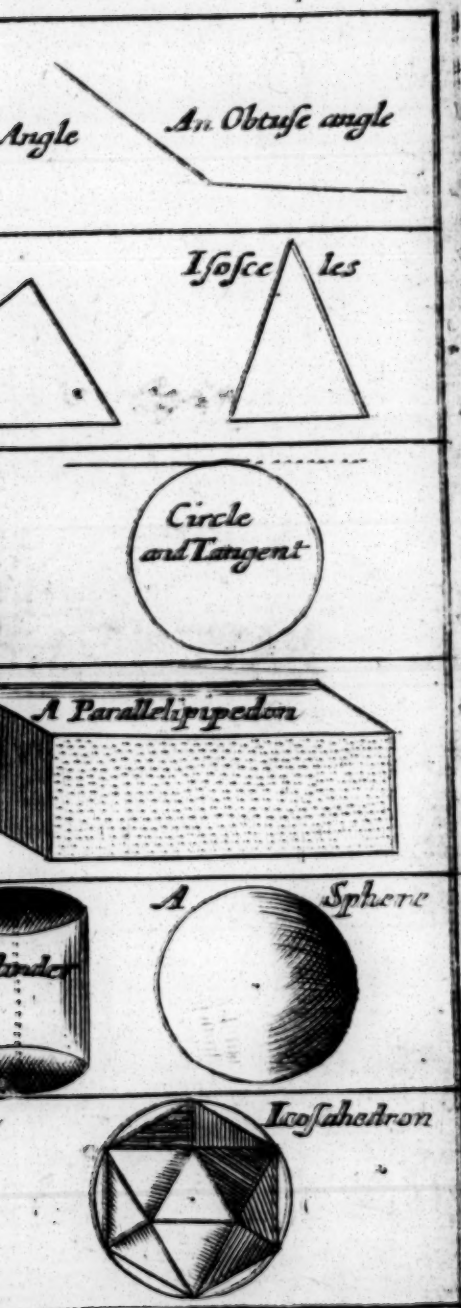
Cone

Cylinder

*Tetra:
hedron*

*Octa:
hedron Dodeca:
hedron*





Mathematical Definitions.

the Centre of this Sphere, is the Middle of this *Axis*. And so the Diameter of a Sphere, is a Right Line passing through the Centre, and bounded at each end in the Surface, or Superficies of the Sphere.

5. A *Cone* is a Solid Figure, arising from a Circular Base of streight Lines ending in a Point called the *Vertex*, or Top thereof, and the *Axis* of this *Cone* is a Right Line drawn from the *Vertex* to the Centre of the Base; and this is called a *Right Cone* and so a *Right Cylinder*.

6. A *Cylinder* is a Solid Figure, rising from a Circular Base as the *Cone* does; but the Right Lines end also in an Equal Circle at Top.

7. *Cones* or *Cylinders* are such, whose *Axis* and the Diameters of their Bases are proportional.

8. A *Cube* (or *Dye*) is a Solid Figure, contain'd under Six Equal Squares.

9. A *Tetrahedron* is contain'd under Four Triangles Equal Sided.

10. An *Octahedron* is contain'd under Eight Triangles, in the same manner.

11. A *Dodecahedron*, is contain'd under Twelve Pentagons, all Equal.

12. An *Icosaedron*, is a Figure contain'd under

Mathematical Definitions.

der 20 Triangles Equal and Equal Sided
and those five last are called Regular B
dies. See their Figures.

53. A *Parallelopipedon*, is a Solid Figure con
tain'd under Six *Parallelograms*, whose
Opposites are all *Parallel*.

54. One *Figure* is said to be *Inscribed* in a
other, when all the *Angles* of the *Figure*
Inscrib'd touch either the *Angles*, *Sides*
or *Planes* of the other *Figure*.

55. A *Figure* is said to be *Circumscrib'd* (or
Circumscrib'd) when either the *Angles*
Sides or *Planes* of the outward *Figure*
touch all the *Angles* of the *Figure* that is
Inscrib'd.

Those that have a desire to see more *Defi*
nitions of this Nature, relating to *Mathe*
matical Discipline, may consult *Euclid's*
Elements: These being sufficient for the
young Student; and most of them are
Explain'd more at large under their Re
spective Heads Alphabetically: and with
all, you may consult the *Figures* at the
beginning hereof, the better to inform
the *Fancy*.

A *Mathe*

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Mathematical Dictionary, &c.



Abscission [or cutting off] of Light ; from the Latin word *Abscindo*, to cut from, is a term in Astrology, and signifies a weakning of a Planet, which happens when three Planets are within the bounds of their Orbs, and the middlemost is a *weighty* Planet ; to which another lighter, being in fewer degrees of the Sign, applies ; and the third being in more degrees, separates from it : But before the first, moving Direct, comes to be corporally joined with the said *ponderous* Planet, the third becoming in the mean time Retrograde, does thereby come up before it to the said middle Planet : Then is the third said to *cut off the light* of the first. It may likewise happen another way, that is, when the middle Planet applies to a conjunction with the last ; but the first being *lighter*, (that is, more *swift* in motion) passes him, and comes first to a conjunction with the Planet which he is tending unto.

Abus, or *Apfis* ; a Latin word, signifying properly, the bowing, or hollow arch of an Oven ;

B

but

but amongst Astronomers 'tis used as well for the *highest part* of the Circle; to which, when a Planet comes, it is at the greatest *distance from the earth* as the *lowest part* thereof, when he is the *nearest to the Earth* that he can be. The first is call'd, the *Apogæum*: The second, the *Perigæum* of a Planet. By the mutation of these *Absides*, or points, and their passing from one Sign to another, Astrologers pretend to discover the *Revolution* of States, &c.

Example, *Absolute Equation*, is the aggregate or sum of the *Excentrique* and *Optique Equations*; and therefore it is called the *Absolute* or *Compound Equation*.

Accidents; Astrologers by this term mean the most remarkable chances that have happened to a man in the *course of his life*: As a grand sickness at such a year: An extraordinary fortune such a year: An eminent danger at such a time, &c. By these, where they have not the true, but only the estimate time when a person was born, they find out the true hour and minute of the Native's birth, as exactly as they could have found out at what age such accidents should have happened to him, had the true time of birth been given them.

Dignities

Accidental and

Debilities are certain casual affections of the Planets, whereby they are strengthened or weakned, by reason of being in such a house of the Figure, or the like. As a Planet in the mid-Heaven has five *Accidental Dignities*: In the 12th house as many *Accidental Debilities*. They are called *Accidental*, because they are suddenly altered, and in contra-distinction to *Essential*.



Essential Fortitudes and Debilities: As when a Planet is in his own House, or in his fallen. The Table of the Planets essential dignities is common in Mr. *Lilly's Almanack*. That of their Accidental Fortitudes and Debilities, you have in his Introduction, p. 115.

Acre, A measure for Land, containing (by the statute) 160 square Rods or Perches. See the appendix.

Acronycal, From a Greek word *Acranychos*; signifying, of, or belonging to the Evening, is one of the remarkable manners of the Rising or Setting of Stars, and different both from Cosmical, or Heliacal: For when a Star rises when the Sun sets, 'tis said to rise Acronically, and when it sets when the Sun sets, 'tis said to set Acronically.

Acute Angle, Is an Angle less than a Right Angle, or less than 90 degrees, and therefore called acute, that is, sharp: As in *Scheme 1.* the Angle D. A. B. containing but 40 degrees, is an Acute angle.

Addition is one of the five vulgar Rules of Arithmetick; and is no more but a putting together, or collection of two or more numbers into one.

Æra, A Latin word, and sometimes from the Greek, called *Epocha*, is the beginning of an account of Time, founded on some extraordinary accident. As we Christians reckon from the birth of our Saviour: The old Romans, from the Foundation of their City, &c. Hence the birth of Christ, or the Building of *Rome*, is called the Æra of our or their account.

Æstival Solstice, from *Æstus*, Summer, *Sol*, the Sun, and *Sto*, to stand; is when the Sun en-

ters *Cancer*, (generally the 11th of *June*) For when the Sun is got furthest from the Equator, and is ready to return, 'tis called a Solstice; that is to say, a stay of the Sun, because he seems then for some time to stand still. The other called the Hyemal, Brumal, or Winter Solstice, is in *December*, when he enters *Capricorn*.

Aggregate, The whole gathered together; the Sum, or Total.

Airy Triplicity; Astrologers having divided the 12 Signs of the Zodiack into four *Threes*, according to the four Elements, call'd *Gemini*, *Libra*, and *Aquary*, the Airy Triplicity.

Alcochoden, or the Giver of Life; is a Planet that disposes of, or has dignities in the Hylegiacal (or principal) places of the Figure when a person is born; and according to his condition, so may the Natives life be expected to be longer or shorter.

Aldebaran, The name of a Royal Fixed Star in the 4th degree of *Gemini*, within almost three degrees of South Latitude, of the nature of *Mars*, and so violent, that Astrologers say, being with the Luminaries, or *Saturn* or *Mars*, especially in the Ascendant, he threatens an untimely or violent death.

Alfridarie, is a word often used by Arabian Astrologers, and signifies a temporary power which the Planets claim over the life of a Native in such an order; which being both difficult and vain, I omit.

Algebra, is an Arabick word, and signifies an abstruse sort of Arithmetick, the Art of Equation, or a certain Rule for the finding out the hidden powers of numbers, as well absolute as respective

respective. See the derivation in *Dee's Mathematical Preface to Euclid*.

Alhabiba, is a word seldom used by English Authors, but signifies only the Label or Index that moves upon the Centre-pin of an Astrolabe.

Aliquot parts, are the even or equal Numbers that may be had out of any great Number; As 6. 4. 3. 2. 1, are severally Aliquot parts of 12; because six may be had twice in 12. Four may be had thrice in 12. Three may be had four times in 12. Two may be had six times in 12. and One twelve times.

Alligation, A Rule of Arithmetick; so named, because it teacheth to knit or bind together divers things of unequal prices, whereby to find how much of each must be taken, according to the question propounded.

Almagest, The Title of an excellent Book, written by *Ptolomy*, of the Sphere, &c.

Almanack, The word is originally Arabick, and signifies as much as distribution, or numeration, whence our annual Books, wherein the days of the Month, Eclipses, Lunations, Festivals, &c. are set down, numbred, distributed, are so called.

Almicanthars, are Circles of Altitude parallel to the Horizon.

Almuten, An Arabian word, and term in Astrology, signifying the Lord of a Figure, or strongest Planet in a Nativity, viz. That Planet that hath most Essential and Accidental Dignities.

Altern Base, A term used in Trigonometry, distinguishing from the true Base: As thus; in oblique Triangles the true Base is always either

the sum of the Sides, (and then, the difference of the Sides is called *the Altern Base*,) or the true Base is the difference of the Sides, and then the sum of the Sides is called the Altern Base. As in the Oblique Triangle, A D E (in Scheme 6) A C is the sum, and A F the difference of the Sides D E and D A; A E is the true Base, and A I the Alternate Base, according to *Norwood*.

Altitude, [Lat. Height,] the Sun, Moon, Stars &c. being any number of *degrees* above the Horizon, are said to have so many degrees of Altitude. Altitude of a Figure, *Rathb. fol. 14.* is the parallel distance between the Top of a Figure and the Base.

Amblygonium, From the Greek *Amblun*, blunt, or obtuse, and *Gonia*, an Angle; is a term in Geometry, and signifies a Triangle, that hath one of its Angles obtuse, that is, greater than a Right Angle. See Angle.

Amblygon, is of the same derivation and signification, but used for an obtuse Cone, viz. A Cone whose Axis is shorter than the Radius of its Base.

Amphiscii, (From the Greek *Amphi*, on either side, and *Scia*, a shadow, or, in English, people of *double shadows*) are the Inhabitants of those Regions under the Equator, or between the Tropicks of *Cancer* and *Capricorn*, because their shadows are cast sometimes towards the North, and sometimes towards the South, according to the Sun's different course; such are the people of the Golden *Chersonesus*, or *Malacha* in the *East Indies*, the Isle of *St. Thomas*, the middle of the Isle of *St. Lawrence*, &c.

Amplitude, Lat. signifies the space and number

of degrees contained between the East or West point of the Horizon, and the Rising or Setting of the Sun, Moon, or any Star; or if the Sun, Moon, or Star be above the Horizon, then so many degrees are contained between the Azimuth of the Sun, Moon, or Star, and the said East or West point, shall be called their Amplitude.

Anabibazon, Gr. *Anabibazo*, to lift up, or rise; The Dragon's-head, or the Northern Node of the ϵ , where she passes from South to North Latitude. (thus marked Ω) is sometimes so called, because 'tis above the other Node, called the Tail.

Anacamptics, A branch of the Opticks, called also **Catoptricks**, a Science, which by the Rays of some luminous object, reflected on a plain superficies, partly obscure, and partly diaphanous, considers, and finds out its form, affections, greatness, distance, and the like.

Anacletics, Are also part of the Opticks, which by the lines of the Stars, and other visual objects, refracted in a medium of different thickness, measures their figures, magnitudes, distances, &c.

Analemma, Gr. [properly the Firmament, but used for] A plain Projection of the Sphere, called also the Orthographical Projection, where the Sphere is cut into two Hemispheres, and the Eye placed at an infinite distance vertically to one of the Hemispheres, then a right line extended from the Eye to any assigned point in the Sphere, called Surface of that Hemisphere, shall project the assigned point upon the plain, and the distance upon the plain from the Apex, or top of the Hemisphere, to the projected point, is equal to the sine of the Arch from the vertex of

the Hemisphere to the assigned point, the Radius being the Semidiameter of the Sphere. See the Description and Use of the English Globe, *sect. 6.*

Analysis, Gr. [A resolution, unfolding, or untwisting of a Matter, Argument, or Problem; Whence the Adjective *Analytical*, done, or doing, by way of opening, or resolving.

Analogie, Gr. [Proportion, or like comparison;] but in Mathematicks 'tis a double comparison, or proportion of Numbers or Magnitudes one to another: As when we say, as 4 is to 2, so is 8 to 4. Hence *Analogical*, proportionate, or alike.

Anareta, Is a Greek word, and signifies, *A cutter off*; and therefore Aströlogers use it for the killing Planet, or Planet threatning death in a Nativity, which is usually the Lord of the Eighth, or one posited near the Cusp of the 8th. &c.

Angle, In Geometry, the meeting of two Lines make an Angle. As in Scheme 3, A is an Angle, so is B and C, &c. Thus B is the Angle of the sides B A and B C; and C is the Angle of C A and C B. Thus the meeting of two Walls in a Building makes a *Corner*, (call'd in Latin *Angulus*, whence this term of Art is derived.) An Angle is either *Right, Acute, or obtuse*. A *Right Angle* is, when a Right Line falls perpendicularly upon another Right Line, so as it leaves an equal space on either side: for where it so touches the other Line, it makes two *Right Angles*. As in Scheme 3, the line B A makes two Right Angles at A, on the line D A C. It contains just 90 Degrees. An *Acute Angle* is less than a Right one, that is, it leaves less space between both sides, and is more *sharpened*. It contains less than 90 Degrees. But

A

an **Obtuse** [blunt or broad] **Angle**, is that which is greater than a *Right* one, and less *sharp*, and contains more than 90 degrees. As in Figure 3. The meeting or joyning of the Lines B A and A C at A, makes an Obtuse or Blunt Angle at B, but all the other Angles except the two Right Angles at A are *Acute Angles*.

In Astrology certain Houses of a Celestial Scheme are called **Angles**, viz. The Horoscope, or the first House, the *Angle of the East*; the 10th House, the *Angle of the South*; the 7th House, *Angle of the West*; and the 4th House, the *Angle of the North*. See Fig. 2.

Angle of Incidence, is an Angle made by a line that falls a-slope upon another line; as in Fig. 1. The line O A falling so upon the line B A, makes at O A B an Angle of Incidence with the line B A.

Angle of Reflection, is an Angle made by a straight line, which proceeds from the Angle of Incidence, as the line A D is an Angle of Reflection to the line A B. And note, that both these terms, **Angle of Incidence**, and **Angle of Reflection**, are chiefly used in Dialling, and sometimes in Astronomy, for calculating Eclipses of the Luminaries. Now in Dialling, the *Angle of Incidence* is made by the straight line that proceeds from the Sun to the Dial-plane. And the *Angle of Reflection* is made by the straight line that proceeds from the *Angle of Incidence*, making on the other side a perpendicular *Angle* equal to the Angle made by a perpendicular, and the line of Incidence, as is best demonstrated in *Ceiling Dials*; for the Glass receiving the beam of the Sun,

Sun, reflects it upon the Ceiling with the same Angle it receives its beam from the Sun; so that the Angle of Reflection is equal to the Angle of Incidence.

Angle of the Sun's Position, is the Angle made by an Intersection of an Arch of a Meridian Line, with an Arch of an Azimuth, or any other great Circle cutting through the body of the Sun.

Angle of Ships Course. See *Sea-man's Epit.* fol. 44.

Angle of the East, &c. viz. The point of the Compass that the Ship Sails upon.

Angle of Parallax. See *Parallax*.

Animodar, commonly called the Animodar of *Ptolemy*, because he invented it; is one of the ways of *Rectifying Nativities*, or artificially to find out the exact minute ascending at Birth; which is thus: Consider the degree of the Sign wherein the last New Moon was before the Birth; or if it were a Full Moon, the degree of that Sign either of the Luminaries that was above the Earth, was in, and see which Planet hath most Essential Dignities in that degree: And if the degree it be in, is nearer to the Cusp of the Ascendant, than to the Cusp of the mid-Heaven, place so many degrees ascending as the Planet that so ruled the degree wherein the last New or Full Moon was, is in the Sign; but if its degrees be nearer the mid-Heaven than the Ascendant, make the degrees of the mid-Heaven the same its are, and so vary your former Figure according to either of those Angles. But neither this way, nor that other called the *Trutine of Hermes*, is so much to be approved as the method

Method of Rectifying by *Accidents*; but are chiefly used in Childrens Nativities, calculated before *Accidents* have happen'd.

Anomaly, from *Anomalía*, Inequality, Irregularity or unlikeness in motion, &c.

Antartick. See *Artick*.

Antecedent of the Reason, By Geometricians is termed the Quantity in all Proportion that refers it self to another: As that to which another refers it self, is termed the Consequent of the Reason. Thus, in the reason of a line of six Feet, to a line of three Feet; the line of six is the Antecedent, and the line of three, the Consequent of the Reason.

Antilogarithme, The Complement of the Logarithme of any Sine, Tangent, or Secant to 90 degrees.

Antiperistasis, An Encounter of Contraries, as Heat kept in by Cold, waxes stronger in it self, or Cold kept in by Heat grows more vehement.

Antipodes, From the Gr. *Anti*, against; and *podos*, a foot; People going with their feet right against ours; or the Inhabitants of one part of the Earth diametrically opposite to another *S. Austin de Civitat. Dei, L. 16. C. 9.* derides the notion; and others of the Fathers denied that there could be any such thing: but now, not only in reason from the spherical form of the Earth, but also from experience, we are satisfied of the truth of the opinion.

Antiscions, From the Gr. *Anti*, against; and *scia*, a shadow, are places of the Zodiack of the same vertue: As the Antiscion Signs are those which, with reference to each other, are equally distant from the first degree of the two Tropical Signs

Signs ☉ and ♄. As for example, The Sun in the 10th degree of *Taurus*, is as far distant from the first degree of ☉, as when he is in the 20th degree of ♄. And therefore he is said to cast his *Antiscion* to the 20th of ♄; that is, he giveth vertue or influence to any Star or Planet that at that time either is in the same degree, or casteth any Aspect into it.

Antoeci, Gr. From *Anti*, against; and *oicos*, an house or dwelling: [*People dwelling just contrary*.] Those are called so by Geographers, that dwell in equal or opposite Parallels, having the same Latitude and Elevation of the Pole, but not of the same Pole, but the other on the contrary side of the Equator; so that as much as the North-Pole is Elevated to one, so much is the South to the other: As the *Antæci* of *London* are those that dwell in 51½ South, having like Ascensions, but in opposite Signs, like length of days, and temperature of Climate, but not in the same, but quite contrary months.

Apertio Portarum, Lat. [An opening of the Gates.] 'Tis used by Astrologers to signify some great and evident change of Air, upon certain meetings or configurations of the Planets, whence such Positions or Aspects are called *Apertiones Portarum*; and those so accounted, are the Conjunctions, Squares, or Oppositions of Planets: Whose houses are opposite: As *Saturn* and the *Sun*; (the house of the latter being opposite to the house of the former.) *Saturn* and the *Moon*, *Jupiter* and *Mercury*, *Mars* and *Venus*, (for the like reason.) And so much greater will the mutation be, if the Moon separate from one, and applying to the other, convey and reinforce their vertue.

Apo

Apomecometrie, From the Greek *Apo*, from *necos*, a distance, and *metria*, a measuring; is an Art teaching the Practiser how to measure things at a distance, viz. how far they are off from him.

Apparent, The apparent or visible place of any Star or Planet, is that place of Heaven which it seems to be in by the straight line that proceeds to it from the eye. See **Parallax**.

Aperature, From the Lat. *Aperio*, to open. The Glass at the further end of a Tube; it hath sometimes part of its circumference covered with a Pastboard, having a round hole in it, that the Object, if it be small, may be the better beheld in the centre of the Glass; and then so much of the Glass as is seen through that hole, is called the **Aperature**, as well as the whole circumference.

Aper, [L. the top, or highest Point.] There are the pictures of Stars placed on the Reets of the Mathematical Jewel, and upon some *Astro-labes*, and one of the points of the Stars is always longer than the rest. This point is called the **Apex**, and is indeed the place of the Star; the whole figure of the Star being made only to guide you thereunto.

Aphelion, A Greek word, from *Apo*, from, and *Helios*, the Sun; is that point in which the Earth, or any Star, is furthest distant from the Sun; as **Perihelion** is when 'tis nearest the Sun.

Apheta, Gr. otherwise called *Hylech*, [The Giver of Life.] In the Figure of ones Nativity, *Ptolemy* reckons up only four Significators that can be so accounted, viz. The Light of the Time; (that is, the Sun by day, the Moon, if born in the night.) The Planet that has most dig-

dignities in the places of the Luminaries, the part of Fortune, and the Ascendent.

Aphorism, Gr. A general rule, or short notable observation experienc'd for a truth in Art.

Aplanes, [Setled, or free from wandering. A Greek word, from *Alpha*, which in composition, is of privative signification, and *planesi*, wandering] Fixed Stars, in contradistinction to Planets, are so called, but most times the Sphere it self wherein they are placed.

Apogeeon, A Term in Astronomy signifying a point in the Heavens where any Planet is farthest from the Centre of the Earth.

Application, is a term in Astrology, used when two Planets within the quantity of their Orbs are drawing near together either by Conjunction, or Aspects: Note, that the superior Planets are not said to apply to the Interiors, (unless they be Retrograde,) but ever the lighter to the more ponderous. As if $\hbar$ be in 10 degr. of *Taurus*, and δ in the 7th deg. of the same Sign, here δ applies to a σ with $\hbar$. If *Mars* had been in 7d. of $\mathfrak{S}$, he had applied to a $\ast$ of $\hbar$, and so of the rest. An Application may happen three ways; as when both Planets being Direct, the swifter overtakes the slower, or when both are Retrograde, and the lighter does not come Direct, till he comes up to the body or Aspect of the heavier; or when one is Direct in fewer, the other Retrograde in more degrees of a Sign. The first brings on business fairly and kindly, the other two either suddenly perfect it, or after many hopes and crosses utterly destroy it.

Apotome, [A thing abruptly cut off; from the Greek *Apotemno*, to cut off.] A term in Geometry

metry: As if from a Rational Line ACD be cut off a Rational Line AC commensurable in power only to the whole; the remainder BC is irrational, and may be called an *Apotome*, or a *Residual*. See *Euclid. Elem.* 10. Prop. 74. for the demonstration, and *Elem.* 10. Third definition.

Apogæon, From the Gr. *Apo*, from, and *gê*, *orgain*, the *Earth*. The highest part of the Planets Eccentric, or Epicycle, or the point where they are furthest off the Earth, and more elevated, and strong. As the Sun is in his Apogæon about the 6th degree of *Cancer*, being then 9588960 miles from the Earth; whereas in Perigæon, when he is in *Capricorn*, he is not above 9272480; so that the whole quantity of his Elongation, or the space between one and t'other is in a direct line 316480 miles. And note, the Apogæa, and Perigæa of the Planets are not fixt always in the same place, but varied in Time; being observed, according to the order of the Signs, to be moved with a daily (but exceeding) slow and almost insensible Progression. All which causes irregularity in the Planets motions, being slower in their Apogæons, and swifter in their Perigæons. See *Abstr.*

Apothæa, The Moon is called so by Greek Authors, when she separates from one Planet, and applies to no other. See *Uoid of Course*.

Aquarius, A Water-bearer, from the Lat. *Aqua*, water. The Eleventh Sign of the Zodiack, thus character'd ♒; 'tis one of the Houses of *Saturn*, of the Aiery Triplicity, &c.

Arch, (By some written *Arke*, and derived from the Lat. *Arcus*, a Bow.) Is a part of a Circle intercepted from one point to another, by which
Geo.

Geometrically, and by way of Proportion, we gather the quantity of the whole Circle, or some other thing sought after, as in Fig. 1. BL is an Arch, so is LI, and LE, or any part of a Circle less than a whole Circle.

Arch of Direction, A quantity of the Equator intercepted between two points in Heaven, whereof one is the place of the Significator, the other of the Promissor; and which one of them, in a certain space of time, must run over, until he is devolved to the other.

Architecture, is a Mathematical Science, which teaches the Art of Building, or a skill obtain'd by precepts of Geometry, &c. teaching the right way of designing all sorts of Structures; and is threefold, Edification, or the Art of building of Houses: *Gnomonica*, or Dialling; and *Machinatio*, the mystery of Machines, or Engines. See *Vitr. L. 2. C. 3.*

Arctick, Gr. [The Bear.] A Constellation in the North part of Heaven, whence the North-Pole being near thereunto, is called the Pole-Arctick; and the Circle described $23\frac{1}{2}$ degr. from the same Pole, The Arctick Circle, as the opposite or South Pole of the World, and Circle thereunto, are termed the Antarctick Pole and Circle. But note, There are two Arctick and Antarctick Circles, viz. Those of the Poles of the World, and those of the Poles of the Eclipse.

Area, Lat. [An open space, or yard, but] in Geometry, the plain superficies comprehended between the sides of any Figure, plain or circular.

Argument, The Arch by which we seek another

er Arch, (or part of a Circle) is called by Mathematicians, the Argument, in resemblance of Argumentation in Logick; for as a Logical Argument leads us to the knowledge of something before unknown, so this Arch notifies to us another Arch unknown, proportional.

Argument of the Moons Latitude, is her distance from the Dragons-Head, or Tail, viz. where the Orbit of the Moon in two points diametrically opposite, is intersected by the Ecliptick, whereby we find out the quantity of the real obscuration in Eclipses, or how many digits are darkened.

Argument of Inclination, is an Arch of the Orbit intercepted between the Node ascending, and the place of a Planet from the Sun, being numbered according to the Succession of the Signs. See *Harmon. Cœlest.* Book 2. Cap. 14.

Aries, Lat. [The Ram.] One of the Celestial Signs, and first in order in the Zodiack, of the very Triplicity; the House of Mars, and Exaltation of the Sun, who coming to enter the first degree thereof, makes the days begin to exceed the nights, which is called the Vernal Equinox, or Revolution of the World.

Arithmetick, From the Greek word *Arithmos*, Numbers, The Art of Numbring, one of the principal Disciplines of the Mathematicks, and which necessarily precedes the rest, being conversant about *Discrete Quantity*, that is, Numbers, and thereby distinguish'd from Geometry, which considers *Continual Quantity*; yet are they not so opposed, but that they joyn hands, and help each other; Geometry carrying the same proportion to Arithmetick, as a point to an unite, a Line to

a Simple Number, and a Body to a Number compounded; and in most of their operations they mutually borrow terms and assistances from one another.

An Example,

Armillary Sphere, From the Latin, *Armilla*, Bracelet, or round Ornament for the Arm. A hollow Sphere made up only of the Circles, and not representing the solid body of the Celestial Globe, or places of the fixed Stars.

Aurora, (Gr.) The Morning or Break of day *quasi aurea hora*, the hour when it begins to shine or be light; 'tis a Term used by Poets, as well as Astronomers, &c.

Artificial { day } From Sun-rising to Sun-setting.
 { night } From Sun-set to Sun-rising.

Artificial { Numbers, } See Logarithmetical
 { Secants, } Numbers, Secants, Sines
 { Sines, } Tangents.
 { Tangents. }

Ascendent, From *Ascendo*, to arise. That part of Heaven which ascends, or is coming up above the Horizon in the East; called also, the *Horoscope*, the Angle of the East, and the *First House* in a Celestial Figure, which signifies the beginnings of things, the life corporate, and manner of a Native, &c. But by some Authors, all that quarter of Heaven, spreading from the fourth House, by the way of the East to the mid-Heaven is called the Ascendant, because the Planets therein, and parts of the *Primum Mobile*, are always rising.

ing; and on the opposite part, from the Meridian to the 4th House by the West, they are always descending. See Fig. 2.

Ascensions and Descensions of Signs, are parts of the Equator, which do co-ascend, [rise] or set with such a Sign or part of the Zodiack, or any planet hapning to be therein. And these Ascensions & Descensions are either **Right** or **Oblique**. Right Ascensions are parts of the Equator, which ascend by a Right Line, comprehending all those parts of Heaven which are contained under a Right Line drawn by the Poles of the World, and the opposite parts of the Equator; and always happen in a Right or Direct Sphere. But in an Oblique Sphere, only in the Right Circle or Meridian. Oblique Ascensions and Descensions are parts of the Equator, which rise or set obliquely in an Oblique Sphere, that is, where one of the Poles is elevated, and the other depressed; and the more oblique the Sphere is, the more oblique will the Ascension of the Equator be, and consequently less of it ascend with Northern Signs, and more with Southern: and, on the contrary, the greater Arch will descend with Northern Signs, and more with Southern. And this Arch of the difference intercepted between the Right and Oblique Ascension, is called the *Ascensional difference*. See here.

The Ascensional difference, [which is only the number of degrees remaining after subtraction of the Oblique from the Right Ascension] For having the Elevation of the Pole of your place, and the Declination of the Star, presently the Ascensional difference appears, which according as the Declination is Northern or Southern, is to be

added or subtracted from the Right Ascension of the same Star; which being done, gives the Oblique Ascension or Descension at the said Elevation of the Pole, by which means Directions are perfected.

Aspect, From the Lat. *Aspicio*, to behold: is a correspondence or familiarity of two Planets mutually beholding each other with some Ray harmonically consider'd; or when they are posited at such a certain distance in the Zodiack wherein they mutually help or afflict one another; or have their vertues encreased or depraved: For by good Aspect they assist, but in evil they are said to hurt each other. Of these Aspects properly there are but 4. viz. *Sextile*, *Quartile*, *Trine*, and *Opposition* to which is added a *Conjunction*, tho' improperly called an Aspect. *Kepler* defines an Aspect thus; that it is an Angle formed on the earth, by the luminous Rays of two Planets, efficacious to the stirring up of Nature; for when two Planets are joined with, or beheld of each other, they seminate something in sublunary Bodies according to their own nature. See Appendix.

Astragal, A Term in Architecture, belonging to the *Ionick* Order. See *Vignola* pag. 44.

Asterism, [From *Astrum*, a Star.] A Constellation; or parcel of fixed Stars put together so as to represent the figure of some particular thing, and thence are called by a common name as the *Bear*, the *Harp*, the *Lion*, &c. are Constellations, or Asterismes. See Constellations.

Astrolabe, A Mathematical Instrument to observe the Sun or Stars with; otherwise called *Planisphere*, because it represents in *Plano*, almost the whole Celestial Doctrine, as the Motions, D

stance

stances, Ascensions, Descensions, Declinations &c. of the Stars.

Astrology, From the Greek *Aster*, A Star; and *Logos*, the speech or reason; and therefore signifies in English, *the speech and language of the Stars*. It is a Science that teaches a conjectural knowledge, obtained from the observation and position of the Stars; of the success of things depending on Celestial Influences; to predict the grand mutations of nature, and natural fortune of man, woman or child.

Astronomy, [The Law of the Stars; Gr. From *Aster* a Star; and *Nomos*, a Law, or Rule.] A Science that teacheth us the affections and motions of the Planets and Celestial Bodies for any time past, present, or to come.

Asymptote, A Term in solid Geometry, of a Line in a Geometrical Figure, wherein is certain Curve or Irregular Lines, arising from the Section of solid Bodies.

Athazer, is when the Moon is in the same degree and minute with the Sun, or when she is 12 degrees, or 45. 90. 150. 168. 180. 192. 215. 270. or 348. degrees from him.

Atmosphere, [The Sphere of Vapours: Gr. From *Atmos*, a vapor; and *Sphæra*, a sphere.] That part of the Air which is nearest to the Earth, as far as the Terrestrial vapours ascend; for the Earth and all the Planets are enclosed in their several Atmospheres; so much of the Circumambient Air as is within the Sphere of their respective Activity, being called the *Atmosphere* of the Earth, or of such a Planet.

Aug. or Auge. See *Absis* or *Apogæon*, for 'tis the same, an old Term in Astronomy now seldom used.

Austral, [Southern] **Signs**, The six last Signs of the Zodiack, viz. ♋, ♌, ♍, ♎, ♏, and ♐, are so called, because they are on the south-side of the Equinoctial.

Automata, [Gr. Self-movers.] Mathematical Instruments or Engines, that going by a Screw, Spring, or Weight, &c. seem to move of themselves; as a Clock, a Jack, &c.

Autumn, Harvest, or Fall of the Leaf, one of the four Quarters of the Year, beginning when the Sun enters ♎. Called so from the Latin Verb *Augere*, which signifies, to Encrease, because then the Fruits of the Earth are encreased to full maturity, and the Husbandman's Gains augmented thereby.

Aux, or *Auge*. See *Apogæon*, which signifies the same.

Axiom, Gr. A common Sentence, Principle or Ground of any Art, generally taken for granted. Or, 'tis a Proposition or short sentence: a Maxim generally allowed to be true and undeniable as in saying, The whole is greater than its part.

The word *Axis* is also used in *Geometry*, as the *Axis* of a cone, of a Cylinder, of an Ellipsis, of an *Hyperbola*, i. e. an Imaginary Line that passes through the Centre, from one end to the other.

Axis, Lar. An Imaginary Line which passing from one Pole of the World through the Centre of the Earth, is terminated in the other Pole about which we conceive the whole Machine or Frame of the World to be turned.

Azimene, Gr. [Lame, or Weak,] Certain degrees in the Zodiack are called so by Astrologers because Persons born when any of them Ascend are generally lame, blind, or have some other incurable Imperfection.

Azimut

Azimuth, is an Arabick word, signifying the Arch of a great Circle of Heaven, imagined to pass from the Zenith to the Nadir, cutting the Horizon at Right Angles.

The **Azores** are Islands in the North Latitude of 40 degrees, said by some to be situated at the true Western Meridian, whence they would Compute the Longitude of all places from thence, rather than the Fortunate Islands.



Backstaff, An Instrument used by Sea-men for observing the Height of the Sun with ones back towards it, whereby the great inconvenience of the Sun's beams glaring in the Eye is avoided.

Balance, Two Stars called the North and South Balance, also one of the Celestial Signs, and 'tis a Term in Mechanicks.

Barren Signs, *Gemini*, *Leo*, and *Virgo*, are counted so by Astrologers: As, as if a Question be propounded whether one shall have Children, or not? If one of these Signs Ascend, or be upon the Cusp of the 5th House, they take it for an Argument, that the Querent shall have none.

Barometre, or the Weather-Glass now used with Quick-silver in a Tube of Glass that Rises against fair Dry Weather, and Falls against Wet, foul, and stormy, &c.

Base, or **Basis**, The Ground-work, or Foundation

dation of a matter, the Pedestal of a Statue; in Geometry and Perspective, either the Ground Line, or the Flat upon which other Lines or Figures are Erected; in Trig. every side may be made the Base.

Bastion, The Fort or Bulwark of any Fortification. See all the Terms thereof in a late Book published by Mr. *Rob. Mordant*.

Battalion, a French word in Military Discipline, signifying a certain Number, or the main Battel, a Squadron of Men drawn up into a Body, either Horse or Foot, or both.

Bay, is a Term in Geography, Architecture or Fortification.

Bearing, The point of the Compass that one place Bears or stands off from another, 'tis often used in *Navigation*. As in the Books of *Sellers, Sturmy, Norwood, Phillips, &c.*

Besieged, is when any Planet is placed between the Bodies of the two Malevolent Planets *Saturn* and *Mars*; as $\hbar$ in 15. $\vee$. *Mars* in 10. of $\vee$, and ♀ in 13. $\vee$. Here Astrologers call *Venus* *Besieged*, and it represents (says Mr. *Lilly*) in Questions, a man's going out of God's Blessing into the warm Sun, if *Venus* be his Significatrix.

Bestial Signs are, *Aries, Taurus, Leo, Sagittary*, and *Capricorn*, because they bear the names and are represented on the Celestial Globe in the Figure of Four footed Creatures.

Bicorporeal, Double-bodied: A word sometime used by Geometricians, but oftner by Astrologers, *Gemini, Sagittarius*, and *Pisces*, are *Bicorporeal Signs*.

Bimedial, If two medial Lines (as in Fig. 4. *AB* and *CD* commensurable in power only, contain

taining a Rational Rectangle, are compounded, the whole *AC* shall be irrational, and is called a first *Bimedial Line*. For the Demonstration, see *Euclid, Elem. 10. Prop. 38.*

Binomial, A Term in *Algebra*, signifying a Root of two numbers or parts. See *Kersleys Algebra*.

Biquintile, Is a new Aspect observed by *Kepler*; so called, because it consists of two fifth parts of the whole Circle, viz. 144. Degrees, and counted a benevolent Aspect, as the *Quintile*, *Sextile*, and *Trine* are, though of a smaller force.

Bisextile, *Leap-Year*; (so called, because then they said twice the sixth Calends of *March*) when once in four years a whole day is added, to make up the odd six hours, which the course of the Sun yearly exceeds 365 days, being inserted, or put in next after the 24th of *February*.

Bisect, [From the Lat. *Bis*. twice, and *Seco*, to cut,] To cut in two. A Line or Arch that cuts another Line, Arch, or Circle into two equal parts, is said to *Bisect* that Line, Arch, or Circle: As in Fig. 1. the Line *BAF* is *Bisected* by the Line *CAI* in *A*, and the Line *CAI* is *Bisected* by the Line *FAB* in *A*; so is the Circle *BCFI* *Bisected* by the two Lines *BAF* in *B* and *F*, and in *CI*, the Lines *CAI* and *FAB*; (being prolonged.)

Bisegment, One of the equal parts so *Bisected*.

Body, is Geometrically defined to be a Magnitude which has length, breadth, and depth, and is either *Regular*, *Irregular*, or *Mixt*: The *Regular Bodies* are five, viz. A *Cube*, a *Tetrahedron*, a *Dodecahedron*, an *Octohedron*, and an *Isohedron*. Some Geometricians would take in a *Sphere* for a sixth *Regular Body*, but others reject it. An Irregular

gular *Body* hath not its sides equal to one another. A *Mixt Body* is made by an equal cutting off the Angles of a regular *Body*.

Bootes, A Constellation of Stars so called in the Heavens, and Delineated or Expressed upon the Celestial Globe.

Bozeal, Lat. [*North*] Signs, γ , δ , π , ϵ , Ω , μ , because placed in the Northern Semicircle of the *Zodiack*.

Box and Needle, An Instrument used in Surveying of Land: and finding out the situation of any side, by the pointing of one end of its Needle towards the North.

Brachialum, Lat. [*A little Arm*] A member of an Instrument sometimes used upon *Astrolabes*, and other projections of the Sphere. 'Tis commonly made of Brass, having several joynts, that the End or Point may be set to any Degree on the *Astrolabe*. It is by English Writers sometimes called a *Creeping Index*.

Broken Radiation, A Term in the *Dioptrick* Art, wherein is considered the breaking of Beams, as they are seen through a Glass or Chrystal, cut into several plains or faces.

Bulwark, A Fort or Fortress to defend a Town.

Bipartition, to divide into 2 parts.

C

Cacodæmon, [The Greek *Kacos*, and *Daimon*, the *Evil Genius*.] Astrologers call the 12th. House so, because of its direful significations, as secret Enemies, Imprisonments, &c.

• *Cadent*,

Cadent, [Falling, or Weak, and Abject; from the Lat. *Cado*, to fall:] are Houses next from the Angles of an Astrological Figure, as the Third, the Sixth, the Ninth, and the Twelfth. Also a Planet is said to be *Cadent*, or in his Fall, when he is in a Sign opposite to that of its Exaltation.

Calends, The Ancient Romans divided their Months into *Calends*, *Nones*, and *Ides*; which way is still used by many writing in Latin. To understand it, observe 1st, That the *Calends* were the first day of the Month; the next were the *Nones*, being 6, in *March*, *May*, *July*, and *October*, and fell on the 7th day of these Months, but in all other Months were but 4, and hapned on the 5th day. The *Ides* were last, eight in every Month, being on the 15th of the four before mentioned Months, but on the 13th of all the rest.

2^{ly}. Note, that they reckon'd all these backwards, as *Calendis Maii*, is the first of *May*; but *pridie Calend. Maii*, the day before the *Calends* of *May*, is the 30th of *April*; III *Calend. May*, *April* 29, and so downwardsto XVIII *Cal. Maii*, which is 14 *April*. Then began the *Ides*, as *Idibus Aprilis* the 13th of *April*; *Pridie Id. Apr.* the 12th *April*, III *Id.* the 11th of *April*, and so on to VIII. *Id. Apr.* which is *April* the 6th. Then were the *Nones*, as *Nonis Aprilis*, *April* the 15th. *Pridie Nonarum*, *April* the 4th. III. *Non. Apr.* the third of *April*, IV. *Non. Apr.* the second, and their *Cal. Apr.* the first of *April*. Thus to go on with *May*, the second of *May* is VI^{to} *Nonarum*, (because we told you that was one of the Months that had 6 of them.) The 3^d day is V. *Non*. The 7th day *Nonis Maii*. The 8th day, VIII of the *Ides* of *May*; The 15th the *Ides* of *May*; but the 16th shall be the 17th of the

Calends

Calends of *June*; The 17th of *May* XVI. *Calend. Junii*, and so on. All which the Ancients, for the help of memory, expressed in these five Verses.

*Prima dies Mensis cujusque est dicta Calenda.
Sex Nonæ Maius, Octobris, Julius & Mars;
Quatuor at Reliqui; Dabit Idus quilibet octo.
Inde dies reliquos omnes dic esse Calendas,
Quos retro numerans dices à Mense sequente.*

Which I thus English,

The *Roman Month* its several days divides
By reckoning backwards, *Calends*, *Nones*, and *Ides*
Eight *Ides* hath each, and but four *Nones*, they say,
Yet six have *March*, *October*, *July*, *May*:
After these *Nones*, and *Ides*, the rest of all
The days you must the next Months *Calends* call.

I have been the larger upon this, because most Authors that have gone about to explain it, have left it in as perplexed an obscurity as they found it, especially to one unacquainted with the *Roman* Usages. From these *Calends* comes our common word *Calendar*.

Calendar. See *Calends*, is an Agreement of the great *Lunar* year with the 19 year *Circle of the Sun*, found out by one *Callippus*, and therefore so called. It contains 76 years; in which time the *Lunations*, or *Changes* of the *Moon*, return to the same day of the *Month*, and hour as before.

Cancer, [Lat. the *Crab*.] A Sign of the *Zodiac* thus character'd ♋; 'tis the House of ♄ and the Exaltation of ♃; and is so called, as well because there are in it 3 Stars on each Side, which represent a *Crab's* Claws, as because the *Sun*, when he

he comes into this Sign hastens to the Equator, going backwards from us like a Crab.

Canicular days, or Dog-days, when the Sun Rises with a Star called the Syreus or Dog Star about July 19. ends August 27.

Canon, [Gr. A Rule.] The Tables of *Artificial Sines, Tangents, and Secants*, are so called. Or a General Rule to Resolve any Problem, is called a *Canon*.

Campaign, From the French, a Wide and Level piece of Ground, fit for an Army to Encamp, a Term much used in War and Military Affairs.

Capital, signifies in *Architecture* the Ornament that is made on the top of a Column, from *Capitalis* in Latin, of or belonging to the Head.

Carpentum, [Lat. A Chariot,] or Throne of a Planet, is when he is Posited in a place where he has most Dignities, as *Aquary* of Saturn, because he hath there both *House* and *Triplcity*; *Sagittary* of Jupiter for the same reason, &c.

Capricorn, [Lat. the Goat,] one of the Signs of the *Zodiack*, the 10th in order thus character'd w. Earthly, dry, and cold; the House of Saturn, and Exaltation of Mars

Chart, or Card [From the Lat. *Charta*, a Paper.] A Draught of Sea-coasts, Sands, Rocks, &c. 'Tis also sometimes taken for the round Past-board whereon the 32 Points are described in the *Nautical Compass*.

Cardines, Lat. signifies properly the *Hinges* of a Door, but is used for the chief or most material parts on which the rest do in some sort depend; As

Cardinal

Cardinal } Points } The *Angles*, or 1st, 4th, 7th,
 Signs, } and 10th Houses.
 The Signs, γ , δ , ϵ , and η .

Cast a Point of Traverse, is a term in Navigation, which signifies to prick down on a *Chart* the Point of the *Compass* any Land bears from you, or to find by Art what Point your Ship bears at any instant, or what way the Ship has made.

Castiopa, A Constellation in the North part of the Heavens, wherein a New Star formerly appeared for many Months together.

Castor and Pollux, in Astronomy is a Constellation of Stars so called, and express'd upon the Globe.

Catabibazon, From *Catabibazo*, a Greek word, signifying to descend, or go down against. The *Dragons-Tail*; sometimes so called, because it goes exactly against the *Dragons-Head*.

Catherus, A Greek word for a *Perpendicular*. See *Perpendicular*.

Catoptricks, A branch of the *Opticks*, or an Art that teaches to Project a Confused Figure, seemingly without a design; yet when it is reflected on a proper Polish'd Body, it shall shew the design. From the Greek words *Cata*, against; and *Opto*, to see; because it chiefly treats of Reflexions.

Cazimi, An *Arabick* word, signifying the Centre of the Sun: so a Planet is said to be in *Cazimi*, when it is not above 17 minutes distant from the Centre of the Sun, as *Saturn* in 3 degr. 31 minutes of *Taurus* and *Sol* in 3 degr. 31 minutes of γ . Here *Saturn* is in *Cazimi*, which is reckoned a great Fortitude to any Planet; but how it should

be

be so, when Combustion is so grand a Debility,
let Astrologers consider.

Centesms, or Hundred parts of any Integer,
whence Decimal Arithmetick is derived.

Centiloquium, A Book containing one Hun-
dred *Astrological Aphorisms* commonly ascribed
to Ptolemy, as its Author, but by some to *Her-*
mes Trismegistus, so called from the Lat. *Centum*,
an hundred; and *Loquor*, to speak: as much
as to say, the hundred notable Speeches.

Centre, A Point in the middle of a Sphere, or
Circle, from which all lines drawn to the Super-
ficies or Circumference are equal. 'Tis also used
in *Perspective* for the *Visual Point*. The word is
Greek, *Centron*.

Chiliades, *Characteristick*.

Chiliades, are the common Tables of Loga-
rithms, Characteristique is the first Figure in each
Number towards the left hand, and is always a
Unit less than the Number of Place, the Lo-
garithm represents, as if ---2, be the Index or
Characteristique, then 'tis the Logarithm of 3 Fi-
gures.

Chord, is a straight line subtended under an
Arch, dividing a Circle into unequal parts, by
which it differs from a *Diameter*: for that passing
by the Centre divides a Circle into two equal
parts. Thus the Lines E L, H O, in Fig. 1. are
called *Chords*.

Chorography, From the Greek *Choros*, a place
or tract of Ground; *Grapho*, to write, describe,
or treat of: Called also *Topography*, is a part of
Geography, which delivers the description of par-
ticular Provinces or Kingdoms only.

Chronocratoz, From the Greek *Chronos*, Time;
and

and *Crator*, a Ruler; being as much as to say in English, *Lord of the time*. Some take it for the Sun in the day, and the Moon by night. Others divide the Life of Man into seven parts, and ascribe the Government of each to a particular Planet; as from the Birth to four years old to the Moon, from thence to 14 years old, to *Mercury*, thence to 22, to *Venus*, &c. And these they call *Chronocrators*.

Circle, Is a plain Figure, contained in one Line only; in the midst whereof there is a Point, from whence all Lines drawn to the Circumference are equal. As in Fig. 1. the Circle is marked GLOBDIFHE, and is described upon the Centre A; from whence all straight Lines drawn to the Circumference are equal.

Circles of Altitude. See *Almicantars*.

Circle of Inclination, is a great Circle about the Sun; in the Sphere of the Fixed Stars, falling right upon the *Ecliptick*.

Circles of Position, Are Circles passing by the common Intersections of the *Horizon* and *Meridian*, and through any degree in Heaven, or the Centre of any Star, or other Point in Heaven, used for the finding out how such a Star is situated, in respect of the World. The twelve *Astrological Houses* are likewise distinguished by *Semis* circles of Position.

Circumference, From the Lat. *Circum*, about; and *Fero*, to bear, or encompass; in Greek *Peri* sphere: They both signifie the outtermost Circular Line, which embraces the whole Area of any Figure. Sometimes the words are used for the whole Superficies of the Earth, or for the *Convex* and outward part of any Celestial Sphere.

Circumferentia.

Circumferentor, Has the same Etimology with the last word; but is also the name of an Instrument used for Surveying of Land: So called; I conceive, because 'tis fit and easie to be *carried about* with one. See *Rathbourn's Survey*, B. 3. Chap. 4.

Civil Days, contain just 24 hours a-piece, reckon'd from 12 a Clock at Noon, or Night (according to the custom of the place) on one day, to the same time the next day. In which space of time, the Equinoctial makes one Diurnal Revolution on the Poles of the World. See *Tutor to Astronomy*, Book 2. Probl. 51.

Civil Year, (So called in contra-distinction to the Natural,) is the Legal Year, used in conversation between man and man, for Bargains, Contracts, &c. which with us begins not till the 25th of March, it always contains only 365 civil days; except in the *Leap year*, and then it has 366 days.

Climate, From the Greek word *Clima*, of the same signification; is a portion of the Earth or Heaven contained between two Parallels. And for distinction of Places, and different temperature of the Air, according to their situation; the whole Globe of Earth is divided into 24 Northern and 24 Southern Climates, according to the half hourly encreasing of the longest days; for under the Equator we call the first Climate: from whence as far as the Latitude extends, under which the longest day is half an hour more than under the Equator, *viz.* 12 Hours and an half, is the second Climate: where it is encreased a whole hour, the third Climate: and so each Northerly and southerly Climate respectively hath its longest day half an hour longer than the former Climate, and in the last Climate North and South, the Sun

Sets not for half a year together, but moves
Circularly above the Horizon.

Climacterical Years : So called from the Greek word *Climax*, a Gradation, or Rounds of a Ladder, because they are the great Steps, or remarkable degrees whereby Man's Life ascends, & mounts up to its appointed period, are certain observable years which are usually attended with some grand mutation of Life or Fortune. As the 7th year, the 21th, made up of three times seven; the 49th, made up of seven times seven; the 63d, being 9 times seven; and the eighty first, which is nine times nine; which two last are often called the Grand *Climactericks*. In wch many famous men have been observed to die. Not only the Learned Heathen; as *Plato, Cicero, Macrobius*, &c. have written much of these *Climacterical* years; but several Fathers, and Doctors of the Church, as *St. Ambrose, Austin, Bede*, &c. have justified the Observation to be neither superstitious, nor unprofitable.

Collection of Light, An Astrological phrase when two principal Significators do not behold each other, but both cast their several Aspects to a third Planet more weighty than themselves, whom they both receive in some of their Essential Dignities; then is such Planet said to Collect, or gather together their Lights, which signifies in Art thus, that a person somewhat interested in both Parties, and described and signified by that Planet, shall by his Interposure effect and accomplish the business, which otherwise could not be perfected.

Column, An upright round Pillar, made according to the Rules of Architecture; the Body of

called in *Lat. Scapus*, in English the *Shaft*, or *Shank*; the Ornament on the Top, *Epistylum*, or *Capitellum*; in English, the *Capital*, or *Chapiter*; that which it stands on, *Basis*, or *Pedestal*.

Colures, So called either from the Greek Verb *Coláo*, which signifies to joyn, or glew together, because the other moveable Circles of the sphere (as it were) Conglutinated or united by these; or from the Greek words *Colobon*, a piece or part divided from the whole; and *Oura*, a Tail; because in the Conversion of the World, these Circles in most places of the Earth, are never seen whole, but only some parts of them, like mutilated Tails: Whatever be the Original of the name, they are two great Circles imagined in the Heavens, passing by the Poles of the World, and mutually cutting each other at right Angles, the one passing from Pole to Pole through the beginning of *Aries* and *Libra*, is thence called *the Equinoctial Colure*; the other through the beginning of $\odot$ and ω , which occasions it to be term'd the *Solstitial Colure*. Their use is, to divide the *Equator*, *Zodiack*, and all the Heaven into 4 equal parts, and shew the 4 principal Points of the *Zodiack*, to which, when the Sun comes, he distinguishes each quarter of the year.

Combust, [Burnt, or scorched; a Participle of the Latin Verb *Comburo*, to burn.] When a Planet is not above 8 degr. and 30 minutes distant from the Sun, either before or after him; he is said to be Combust, or in Combustion, as γ in 10 degr. of γ , the Sun in 18 of γ ; here γ is Combust, which is always a great Debility; and in Judgment shews, that the party by such a Planet signified, is in great fear, and much over powered by

some great person. And note, Combustion is much the worse, when the Sun hastens to $\odot$ with the Planet, than when he recedes from him; in regard its the Body of the $\odot$ that doth afflict.

Combust way, by reason of several violent and malefique Fixed Stars in the second half of *Libra*, and throughout the whole Sign *Scorpio*. All that space is called *Via Combusta*, the *Combust way*, being about 45 degrees in Longitude, which is counted unfortunate, and to weaken any Planet that happens to be therein, especially the Moon, who is there so much Debilitated, that it is reckoned next to an Eclipse.

Cometes, Gr. A Comet, or Blazing-Star: so called from another Greek word *Kome*, Hair; because most Comets seem to have hairs about them. There are several opinions, or rather opinions concerning the Matter they consist of; but the most vulgar opinion is, that they are Earthy vapours, having gross parts strongly compacted, which being drawn up sometimes even above the Orb of the Moon, are there set on fire, and continue flaming for some time; and then, the matter being consumed, disappear. They are generally thought to be as beacons fired, to foreshew the approach of Divine vengeance, in Sword, Plague, Famine, or some other lamentable Calamity.

Commanding Signs, These first six, γ , δ , ϵ , ζ , η , and θ , are accounted and called so by Astrologers.

Commensurable in Power, [From the Lat. *Commensurable* or *cum & mensura*; that is to say, equal measures] Right Lines are said to be commensurable in Power, when their Squares are measured by one and the same space, or Superficies. See *Euclid Elem.* 10. Definit. 3.

Com

Commensurable Magnitudes, } A|--| |--| |--| |--| |--| }
 are such as are measured by }
 one and the same Common }
 measure; as A and B by C; } B|--| |--| |--| }
 for Crepeated 6 times mea- }
 sures A; and repeated three }
 times, B: Therefore A and } C|--| }
 B are said to be Commen- }
 surable. See *Eucl. Elem.* 10. }
Def. 1. 2, &c.

Common Signs, are π , ϖ , $\uparrow$, $\times$. So called, because they are characteriz'd in a double form; and for that, being respectively at the end of each Quarter of a year, they partake of more or less of both Quarters; as the Sun in *Pisces* not only ends the Winter, but begins the Spring. Under these Signs are born, as Astrologers say, Twins, Hermaphrodites, Monsters, &c.

Compass, An Instrument Sea men use to Steer the Ship by, much more easy to be understood by a Sight, than the best description.

Complement, [Lat. From *Completio*, properly a filling up, or making good:] And therefore in Arithmetick it signifies that number that makes a lesser Number equal to a greater Number. As 45 is the Complement of 45 to 90; so in Geometry 'tis used in the Mensuration of Figures and Bodies: as if a Figure or Body contain 7 foot, and 4 foot be measured out of it, here 3 is the Complement. But by the Complement of an Arch, is usually understood so much as the Arch wants of 90 degrees to make it a Quadrant, or so much as it wants of 180 degrees to make it a Semicircle, or so many degrees as it wants of 360 degrees, to make it a whole Circle.

Complement of the course. See *Sea-man's Epit.* pag 44. which is but the points the Course wants of 90 degrees, or eight points, viz, a Quarter of the Compass, &c.

Composite Order, A Way or Order in Architecture Compounded out of the other 4 Orders *Tuscan, Dorick, Ionick,* and *Corinthian*. 'Tis used therefore to distinguish the size and shape of Columns. See *Vignola's Compleat Architect*, pag. 64. And when Authors say, *The Composite Capital*, or *Composite Base*, they only mean the Capital or Base that belongs to a Column of the *Composite Order*. So called, because it partakes, and is composed of the rest, as aforesaid.

Compound Equation. See *Absolute Equation*.

Compound Number, is that which some Number may measure besides Unity; as 15, which is measured by 5 and 3.

Composition of Reason, is when the Antecedent with the Consequent are taken together, as one to be compared to the same Consequent, called *Composition of Reason*, because of the Antecedent and Consequent, there is compounded another new Antecedent. See *Euclid*, 5th. *Element. Def. 14*.

Coefficient, A Term in *Algebra*. See *Kersey's Works*.

Concave, Lat. Hollow, or Bowing: As the face of Heaven appears to us; or the inside of a Tube, or the like. The contrary side of which bulging out, is called *Convex*.

Concentrick, Having the same Centre; as all Circles that are drawn from one Centre, though never so great or little; whence Astronomers call those Celestial Orbs, *Concentrick*, whose Centre is the

the same with the Centre of the World; as they term those *Eccentric*, (of a different Centre) which, though they encompass the Earth, yet they have another Centre, and not that of the World.

Cone, [From the Greek *Kónos*, properly a Pine-Apple;] and from thence it is used by Geometricians to signifie a like Figure, viz. A Body with a round flat Base, upon which every side of it is placed, so as it ends at the top, in a Point hanging directly over the Centre of the Base.

Conoide, A Solid Body like a Blunt or Obtuse Cone, in which form some Brewers Vessels are made,

Constellation, A company of Stars called by one name. See *Asterism*; from the Lat. *Cum*, with, and *Stella*, a Star; as much as to say, many Stars one with another. As *Aries* is a *Constellation*; the Great Bear is a *Constellation*; the Little Bear is a *Constellation*, *Bootes*, *Auriga*, *Canis Major*, &c. are *Constellations*.

Contingent, Contained in a Body or Figure.

Contingent Line, is a streight Line whereon is set the distances of the hour Lines in the making Sun dials; from the Lat. *Contingo*, to happen upon, or touch: it is indeed a *Tangent* Line.

Continuation, Vide the Appendix hereunto.

Contra Antiscion, Gr. The degree and minute in the Ecliptick, opposite to the *Antiscion*. Which see, page the 11th hereof.

Convex, Lat. The out-side of a Ball, Globe, or any round Body. See *Concave*, that being the internal, this the external side or prospect of the same thing.

Converse Direction, is a deduction of a Significant to the place of the Premittors, made by the

motion of the *Primum Mobile*, contrary to the succession of the Signs.

Copernican System, is that *Hypothesis* that makes the Sun the *Centre* of the Universe.

Corinthian Order, One of the 5 *Orders* in Architecture, whereby to distinguish the size and shapes of Columns; and the Bases, Capitals, &c. thereunto properly belonging. See *Vignola's Architect*, pag. 52. because invented, or chiefly used at the City of *Corinth*.

Corollary, An Addition beyond what was proposed. The Consequences and Illustrations following Geometrical Problems, are called so in Mathematical Authors.

Coztin, A Term in Fortification.

Co-Secant,
Co-Sine,
and
Co-Tangent. } The Complement of *Sines*, *Secants*, or *Tangents*, to 90 degrees, or so many degrees as they want thereof respectively. See *Secants*, *Sines*, and *Tangents*.

Collick, The old word for *Algebra*, or *Coffe*.

Cosmical, Stars are said to Rise *Cosmically* when they Rise with the Sun; and to set *Cosmically*, when they Set when the Sun Rises.

Cosmography, An Artificial description of the whole World, Earth and Heavens, and the several parts thereof; but 'tis sometimes used only for Geography, or a description only of the Globe of the Earth.

Course, A Sea-term signifying the Point of the Compass which the Ship Sails upon. As if you Sail Eastward, 'tis an Easterly Course, &c.

Crepusculum, or Twi-light, or Day-break

Crisis, and **Critical days.** These terms are chiefly used by Physicians; but since they cannot be found out but by Astronomy, we shall here briefly explain them. *Crisis* is used for a sudden change of a Disease into better or worse, Life or Death; and because by experience it hath been found that such changes happen for the most part regularly at such and such times; Hence they call those days *Critical days*, which are commonly believed to be every 7th day, by reason of I know not what kind of vertue in that number: but the truth is, the reason of those conflicts between Nature and the Disease, is the Moons coming to the Quadratures, Opposition; or Radical place; where she was at the beginning of the sickness; and one of these generally happens about the 7th day; but as the Moon is swifter, or slower in motion, it often comes sooner or later. Therefore the discreet Physician ought to consult *Ephemerides*, without which they cannot give any true or rational Account of their observing these Critical days: For the better doing it, they should Erect a Scheme with 16 Houses, the form whereof you have in Mr-*Culpeper's Semiotica Uranica.*

Cronical. See **Acronical.**

Cross-Staff, An Instrument Sea-men use to observe the Height of the Sun or Stars with.

Cube, A Solid Body containing equal and square Sides; as a Dye.

Cubed Cube, The sixth Power in Numbers.

Cube Number, The Third Power in Numbers.

Cube Root, The Root or side of the third Power: So if 27 be the *Cube*, 3 is the Side or Root.

Cubed Square, The Biquadrat, or 4th Power.

Thus

Thus 2 is the Side, 4 the Square, 8 the Cube of 2, 16 the Biquadrate, 32 the 5th Power, and 64 the 6th Power, or *Cubed Cube*.

Culmen Coeli, The highest Point in Heaven that any Star or Planet can rise to in any Latitude. 'Tis taken by Astrologers for the 10th House; and when a Star comes to the Meridian of any place, 'tis said to **Culminate**, or be **Culminant**.

Cuneus, Lat. A Body in form of a *Wedge*, and sometimes a Ruler or Label fitted to a Projection of the Sphere *in Plano*.

Curved, or } Crooked, or a Body Hollowed;
 or } whence Figures consisting of Tri-
Curvilinear, Angles, Quadrangles, &c. when they are considered as, or referred to Circles in the Heaven, are called *Curvilinear*, because they all consist of Arches of Circles distorted or bent, and not real Arches, or to be made by the common Compasses; but found by Points, or an Instrument made on purpose to draw *Eliptick Figures Parabola's, Hyperbola's, &c.*

Cusp, The beginning or first Point of each of the 12 Astrological Houses so called.

Cycle [the very same with Circle] of the Moon, Is the Revolution of 19 years, which being expired, all the Lunations return to their former place in the Calendar.

Cycle of the Sun, Is a Revolution of 28 years, for finding out the Dominical Letters, which then return all in the same order as before.

Cycloide, is a Figure used in Solid Geometry and Algebra, described and demonstrated in most Authors of that Subject, as in Dr. Wallis's Works, &c.

Cylinder,

Cylinder, [Gr. properly a Rowler, such as is used in Gardens] whence in Geometry 'tis used for any Solid Body of that shape, *viz.* whose Base and Top are Flat, the Circumference of its Bases Round and Equal, and its Shank Long and straight.

Cypher or **Cyfer**, a Character used in Arithmetick, in form somewhat like the Letter o, which alone or before (that is, towards the left hand of) any Numerical Figure, signifies nothing; but after another Figure, (that is, towards the right hand) increases that Figure ten times; if two Cyphers be placed after a Figure, they increase it a hundred times; if three, a thousand times: as 10, 100, 1000, &c. But in those numbers called *Decimals*, they decrease towards the left hand in the like proportion.

D

Dark Degrees, [Lat. Things given or granted] a Term in Geometry for something proposed or known, in order to the finding out of other things unknown. As two Sides and an Angle given in a Triangle, to find the third Side; Here two Sides and an Angle are the **Data**. See *Euclid's Data*.

Davi's Quadrant, An Instrument used by Seamen, wherewith they observe the Height of the Sun, with their backs towards it, to avoid its glaring in their eyes. See *Back-staff*.

Daily Motion, The Progress which any Planet makes in 24 Hours, by his own proper Motion.

Debis

Debilities, [Lat. *Weaknesses*.] Certain Affections of the Planets, whereby they are weakened and their Influences become less vigorous, or more depraved; and they are either Essential, as when a Planet is in his detriment, Fall, or Peregrine; or Accidental, as when he is in the 12th. 8th. or 6th Houses; or combust, or beheld of the Infortunates &c. By each of which Circumstances, as he is comparatively more or less afflicted, so he is said to have in such a case so many or so few Debilities.

Decanate, (From *Decem, Ten*) by some called *Decurie*, and in Astrology, *The Face*, is one Third part [or Ten Degrees] of each Sign, attributed to some particular Planet, who being therein, shall be said to have one Dignity, and consequently cannot be Peregrine; though if he be not otherwise fortified, we may repute him like a man ready to be turn'd out of doors, having much ado to keep up his sinking Credit. How these *Faces* are assign'd, you may see in the Table of Essential Dignities, commonly printed in the *Tutor to Astrology*, *Coley's Clavis*, or *Lilly's Introduction to Astrology*.

Decimal Arithmetick, [From *Decem, Ten*] or *The Art of Tens*, wherein any Integer, as Pounds, Yards, Perches, &c. are taught to be divided into Ten, a Hundred, or a Thousand parts, &c. See *Kersey's Arithmetick*.

Declination, [Lat. a bending, stooping, or going downwards] is a Term in Astronomy, used for the bending or Digression of any Star, or part of Heaven, from the Equator towards either of the Poles of the World; and to which of them it happens to be, thence 'tis called North Declination or South Declination. The beginning of *Arid*

and *Libra* have no Declination at all, because they fall upon the Equator : but the Fixed Stars and Planets may Decline as far as the Parallels in which they are, even to 90 degrees. By the Declination of a Star, we know the Quantity of its Diurnal and Nocturnal Arch, its Elevation above the Horizon, Distance from the Zenith, Circle of Position, and the like. Of great use in Astronomy.

Declination of a Wall or Plain for Dyals, all Authors thereof most fully explain and demonstrate. .

Decumbiture, [Lat. properly a Lying down.] In Astrology 'tis understood for a Figure erected at that moment, when a Disease first invades a Person, or when he is first so sensibly afflicted, as to take notice of it, and keep his Bed or Chamber, or refrain his Business. By which Figure of the *Decumbiture*, the Artist finds out the nature of the Disease, Parts afflicted, Prognosticks of Death, or Recovery, the most proper Medicaments, true Times of the *Crisis*, &c.

Definition, An Explanation, which in few words fully expresses what the thing is that is spoken of. See *Euclid's* Definitions in his several Books.

Deferens, [From the Lat. *de* and *fero*, to carry] or, The *Deferent*, signifies in Astronomy a Circle or Orb, carrying not so much the *Epicycle*, as the very Body of the Planet fix'd therein, and causing the same to be roll'd about the World, whether in its *Epicycle*, or proper *Orbite*. See *Ricciolus* 3. c. 20.

Degree, The 30th. part of a Sign, or rather the 360th. part of the whole Circle. As in Scheme 1. the

the several small spaces between the two innermost Circles, are Degrees. Each of these Degrees are divided into 60 parts, called *Minutes*, each Minute into 60 parts more, called *Seconds*, and so to *Thirds*, *Fourths*, *Fifths*, &c. The distance of one Degree of Heaven is vulgarly accounted to give 60 Miles on Earth; but by Mr. *Norwood's* Experiment it is 69. Of these degrees, Astrologers have noted some to be smoaky, some to be dark, some deep-pitted &c. of which you have a Table at large in the *Tutor to Astrology*, and in all Books Introductory to the Art of Astrology.

Denominator, Of a Fraction, is shewed in all Books of Arithmetick, as in this $\frac{1}{2}$ which is one half, the 2 is the Denominator, and the 1 the Numerator. See Authors, &c.

Depress the Pole. So many Degrees as you Sail or Travel from the Pole, you are said to depress the Pole, because it becomes lower and nearer to the Horizon; And so many Degrees you approach towards it, so much you are said to raise the Pole, because then it becomes higher and nearer the Zenith.

Descension, A Setting, or going down. See **Ascension**.

Detriment, [Lat. properly Loss or Damage] Astrologers call by that name one, and the greatest of the Essential Debilities of a Planet, viz. the Sign that is Diametrically [or Directly] opposite to that which is his House; as the Detriment of the Sun is ♋ , because opposite to ♏ ; of the Moon ♊ , because opposite to ♏ .

Dexter Aspect, [Lat. a beholding towards the Right hand] Is an Aspect contrary to the Order of the Signs; h in V, casting his ♄ ; ♋ , or ♌

to any Planet in π , ψ , or $\uparrow$. This is called a *Dexter Aspect*, or beholding towards the Right hand, or forwards : Whereas if being so in γ , he beholds a Planet in Π , $\S$ or Ω , according to the natural Succession of the Signs, 't would be a *Sinister* [or Left-hand] Aspect. And note, that the *Dexter Aspect* is, by the Ancients, accounted more forcible than the *Sinister*; but this is contradicted by others. See the *Tutor to Astrology*, p. 55. and other Authors mentioned before.

Diagonal, [From the Gr. *Dia*, and *Gonia*, of or belonging to a corner] In Geometry a Streight line drawn from one Angle of a Square to the opposite Angle.

Diagram, A Figure made with Lines or Circles, for the Demonstration of any Geometrical Proposition, such as you have throughout *Euclid's* Elements. But in Musick it signifies a Proportion of Measures; distinguished by certain Notes.

Diameter, [From *Dia*, of or belonging; and *Materia*, the Measure of a thing] A Line which goeth through the middle part of any Figure; or more properly, as 'tis defined by our great Master *Euclid*, A certain Line drawn through the Centre, and terminated at each end in the Circumference of the Circle, thereby dividing the Circle into two equal parts. As in Fig. 1. the Line FB is the Diameter.

Diametrically opposite, Overthwart, right across, or exactly contrary, as one end of a Diameter is to the other.

Dichotomies, Divided into two parts. Vide *Stron. Carolina*, fol. 12.

Dichotomy, Vide *Ram.* fol. 21.

Difference of Ascension, See *Ascensional Difference*.

Digit,

Digit, [Lat. properly a Finger, or a Fingers breadth,] but used by Astronomers for one Twelfth part of the Body of the Sun or Moon, which they divided into so many parts, that they might know to a twelfth part how much of them was obscured in Eclipses. Some Writers make a Digit the 24th part of the Sun or Moons Diameter.

Dignities, Are certain Advantages which a Planet hath by vertue of being in such a place of the *Zodiack*, or such a Configuration with other Planets, &c. whereby his Vertue is encreased and augmented.

Dimetient, Lat. The Measurer : But see *Diameter*, being the same thing.

Dioptr, Gr. A Rule or Line placed in the middle of an *Astrolabe*, or any the like Instrument; called by some *Linea Fiducia* ; by others, *Albidada*. Which see before.

Diapason, **Diapente**, **Diatessaron**, &c. are Terms in Musick, which shew the proportion of Sounds, as Fifths, Eights, &c.

Direct, A Planet is then said to be *Direct*, when by its proper motion it goes forward in the *Zodiack* according to the succession of the Signs, as from 10. degr. of ϑ to 20. and thence into Π .

Direction, is a real motion perform'd by the motion of the *Primum Mobile*, where by the Sun, Moon, or any other Star, or part of Heaven, that at a mans Birth was his Significator, or is said to effect any thing concerning him, are carried to another Star, or part of Heaven, signifying likewise something referring thereunto; and as it were expecting the same to compleat an effect; thereby accomplishing what in the *Radix* was signified according to the time of their *Revolution* each to other;

ther. The manner of Directions and Directing, shewed copiously in *Coley's Clavis Astrologia Limata*.

Discus, [Lat. properly a dish or platter; whence comes to signify] any Figure Round and plain. And because the Bodies of the Luminaries, all no really Spherical, by reason of their distance, seem plain; therefore they are called *Discus Solaris, vel Lunaris*, the *Disc* of the Sun or Moon.

Disposito, [Lat. The Disposer.] In Astrology that Planet which is Lord of the Sign in which another Planet happens to be, whom he is therefore said to dispose of.

Distance, A term oft used in Navigation, and signifies the Number of Degrees, Leagues, &c. that a Ship has Sailed from any proposed Point, or the Distances in Degrees, Leagues, &c. of any two Places.

Diurnal, [from *Dies*, a Day,] daily, or of or belonging to day. But Planets or Signs are called *Diurnal*, which contain more Active than Passive Qualities; as on the contrary, they that abound in *Passive Qualities*, are said to be *Nocturnal*. For Example, since *Saturn* is more cold than dry, & *Jupiter* more hot and moist, the *Sun* more hot than dry, they are term'd *Diurnal Planets*. But *Mars* being more dry than hot, and the *Moon* more moist than cold, are stil'd *Nocturnal*. The like observe of Signs.

Diurnal Motion, is so many degrees and minutes as a Planet moves by his proper Motion in 24 hours.

Diurnal Arch, The Arch of Degrees that the Sun, Moon, or Stars runs between their Rising and setting.

Dodecaedron, Gr. From *Dodeca*, twelve, and *Edron*, a Side. A Figure in Geometry of Twelve Sides, or as *Euclid* defines it; A Solid Figure contained under Twelve equal *Pentagons*, of equal Sides, and Angles. As *Tetraedron* is a Figure consisting of 4 Triangles; *Octaedron* of eight Triangles; *Icosaedron*, a Figure contained under twenty equal and equilateral Triangles: So the *Dodecaedron* consists of twelve *Pentagons*.

Dodecatemoron, Gr. properly the twelfth part of any thing, but generally used for a Sign, or 12th part of Heaven: As when we say, the *Dodecatemoron* of *Aries*, or *Taurus*, &c.

Dominical, [or Lords-day] Letter, From the Lat. *Dominicus*, one of the first 7 Letters of the Alphabet, wherewith the Sundays are marked throughout the year in Almanacks: To find which it is for every year, there are several Common Tables and Rules.

Dorick Order, [from the *Dorii*: A people of *Achaia* in *Greece*, where this sort of Building was first invented.] One of the 5 Orders in Architecture: The perfect description whereof, see in *Vignola's Complete Architect.* pag. 5.

Doubtful Cases. See *Collins's Sector* on a Quadrant, Fol. 85, 86, 87, &c.

Dragons Head, Two Points where the Orbit and Tail, of the Moon Cuts the Orbit of the Sun, and the Ecliptick; the one of them tends Northwards, the Moon beginning there to have North Latitude, and the other Southward, where she Commences South Latitude. This her deviation from the Ecliptick seems to make a Figure like that of a Dragon, whose Belly is where she has the greatest Latitude, and

and the Intersections represent the Head and Tail; from which resemblance tis so called. But note, these Points abide not always in one place, but have a motion of their own in the *Zodiack*, but Retrograde almost 3 minutes a day.

Dumb Signs or Degrees, or *Mute*, consult the Astrological Authors before mentioned.

Duplicate, [or Double] Proportion; double the size or proportion of one Figure or Body to another Figure or Body.

Duplicate Reason. See *Euclid. Element. 5 Defin. 10.*

Dysis, The 7th House, sometimes so called. The word in Greek signifying the West.

E

Earthy Triplicity, Signs whose Nature and Influence participate of Earthy qualities, viz. Coldness and Dryness; which are *Taurus, Virgo,* and *Capricorn.*

Eccentrick, [A Greek word, from *Ec*, the Præposition, and signifying, out of; and *Centron*, a Centre.] Not having the same Centre with the World, or with an assigned Circle, of which kind several Orbs were Invented by Ancient Astronomers, to solve the Appearances of the Celestial Bodies. Thus the *Eccentrick* Orb of any Planet, is that the *Concave* and *Convex* of whose Deferent have each of them a different Centre from that of the Universe: But because these *Eccentrick* Orbs

are carried with a rapid motion about the Earth; they thought it necessary there should be two other Orbs to include and carry about the former, which in one part, viz. their *Concave* or *Conver* should be *Eccentricks*, and in the other *Concentricks*, (that is, having the same Centre with the World,) So that each Planet was supposed to have three several Orbs, &c. But this confused Celestial Clock-work, the *Copernican System* has pretty well removed.

Eclipse, [a wanting or failing, from the Greek word *Eclipseis*] A deprivation of the Light of one of the Luminaries, when by their Conjunction in the Orbit of the Sun, his Face, by the Interposition of the Moons Body, is hidden from our sight: Or when their Opposition in the same Orbit, the Moon, by the shadow of the intervening Earth, is obscured. But between an Eclipse of the Sun, and of the Moon, there are several differences. 1. In the Lunar Eclipse, she really loses her Light, and is obscured, by wanting the Illumination of the Sun; but in the Solar, he loses not his Light, but only we are deprived of it. So that to speak properly, we should call it an Eclipse of the Earth, rather than of the Sun. 2. As the Moons Eclipse is Real, so 'tis Universal, and appears always in the same Quantity on every Superficies of the Earth, where 'tis visible; but the Suns Eclipse is not Universal, but varied greater, lesser, or not at all, according to the diversity of the several Climates. Lastly, the Moon always begins to be Eclipsed on the West side, the Sun on the East side their Bodies.

Ecliptick, [so called from the Greek Verb *Ecleipo*, which signifies to fail, or want, because under

Under this Line, the Sun and Moon is in the middle of the Zodiack, and always suffer their Eclipses, or fail of their Light.] A Line, or rather a great Circle in Heaven, equally distant from its Poles, as the Equator is from the Poles of the World. This is called *Via Solis*, the *Sun's Way*, or Orbit, because the Sun never goes out of it; and is termed the *Ecliptick*, because all Eclipses happen therein.

Elections, [From the Latin, *Eligo*, to choose.] Astrologers mean by this Term certain opportunities of Times, elected (or chosen) by Astrological Observations, as most fit for such a particular Business or Enterprize.

Elements, Lat. The first Roots or Principles of Things, as *Fire*, *Air*, *Earth*, and *Water*, whereof all Bodies are composed. So Letters are called the first Elements of Learning; and *Euclid's* Fifteen Books of *Geometry* are so called, because without being acquainted with the Principles therein laid down, no Mathematical work can be undertaken and demonstrated.

Elevated, [From the Lat. *Eleva*, to lift up] A certain pre-eminence of one Planet above another; or, A concurrence of Two to a certain Act, wherein one being Stronger, is carried above the Weaker, and does alter and depress its Nature and Influence: But wherein this being Elevated consists, there are several Opinions; some say, when a Planet is nearest the Zenith, or Meridian: Others will have it only that Planet that is highest, or nearest to the *Apogee* of his Eccentrick or Epicycle. And *Argol* admits of all these, and several other Advantages, and thence advises to collect the several Testimonies, and that Planet who has most, shall be said to be Elevated above the other

Elevation of the Pole, The Height or Number of Degrees that the Pole in any Latitude is above the Horizon.

Ellipsis, Gr. An Oval, or Geometrical Figure, in shape of an Egg, comprehended in one only Line, but that not Circular, nor having all its parts equally respecting the Centre: But from two *Focus* or *Navel* points as most Geometers shew.

Elongation, Lat. The removal of a Planet to the furthest distance it can be at from the Sun; commonly taken notice of in *Venus* and *Mercury*.

Embrasure, A Term used in Architecture and Fortification, To hold fast together, &c.

Emersion, coming forth of Darkness, as the Sun or Moon coming out of an *Eclipse*.

Embolism, A Greek word, signifying the *Interlacing*, or *putting in* of a day in the *Leap-year*, but used for the Excess of the Solar Year above the Lunar, whereby the Lunations happen every subsequent year eleven days sooner than in that fore-going; which when they amount to 30 days, make a new Month, called the *Embolismical Lunation*; which must be added, to make the common Lunar Year equal to the Solar.

Empyreum, [From the Greek word *Pyr*, signifying Fire] The Heaven of Heavens, the Throne of God, Residence of Angels, and Eternal Mansions of Saints.

Emergent, The same with *Emersion*, &c. A Planets getting out from under the Suns Beams, and becoming visible.

Enneagon, A Circle divided into 9 equal parts, or a Polygon Regular, or Figure, of 9 equal Sides. So there is the *Pentagon* of 5, the *Hexagon* of 6, the *Heptagon* of 7 equal Sides, &c. Derived from the Greek.

Enneatical Days, [from the Gr. *Ennea*, or *Nine*] Every 9th. day, of a Sickness, or Year one's Life, which is thought to bring some great alteration in the Disease, or Mutation of fortune. See **Critical** and **Climacterical**.

Epaet, [quasi *Epianeta*, that is, An Augmentation, or Additional Supply] 'Tis used for a Number whereby we note the Eccess of the common Solar Year above the Lunar, and thereby may find out the Age of the Moon every Year: For the Solar Year consisting of 365 Days, the Lunar of 354, the Lunations every Year get 11 days before the Solar Year; but thereby in 19 Years, the Moon compleats twenty times twelve Lunations, or gets up one whole Solar Year; and having finished that Circuit, begins again with the same; and so from 19 Years to 19 Years: for the first Year afterwards, the Moon will go before the same but 11 days; the second Year 22 days, which is called the *Epaet* of that Year; the third Year, 33 days; but 30 being an entire Lunation, cast that away, and counts that Year *Epaet* only 3; the next Year 14; and so on, adding yearly 11 days, and casting away 30, when the Number amounts to more.

Ephemeris, [From the Greek *Hemera*, a Day] A Diary, or a Day-Book; but especially amongst Astronomers those Books which contain the daily Motions of the Planets, with their Aspects, and other Circumstances, for every day in the year, are called *Ephemerides*.

Epicycle, Gr. A little Circle, whose Centre is in the Circumference of a greater; or a small Orb, which being fix'd in the Different of a Planet,

is carried along with its Motion, and yet with its own peculiar Motion carries the Body of the Planet fastened to it round about its proper Centre, which Ancient Astronomers attribute to all the Planets, for solving their Appearances, except the Sun.

Epocha, [or rather *Epoche*, In Greek it signifies a Root or Beginning] but 'tis generally taken for some remarkable Occurrence, from whence, in manner whereby, some Nations Date and Measure their Computation of Time; as the *Olympiads* amongst the *Greeks*, the *Indictions* among the *Romans*, &c.

Equants, An old Term in Astronomy, now not used.

Equicrural, Two equal Sides in a Triangle. See *Euclid's* Definitions to his first Book.

Equilibra, Any two Bodies equally Poysed or Hung.

Equal Reason. See Reason.

Equinoctial, { [From the Lat. *Aequus*, Equal
or { and *Nox*, the Night] A great

Equator, { Circle, equally dividing the
Sphere into two parts, whereof one lies towards the North, the other towards the South Pole, this Circle lying in the middle, and equalling all parts. Whence by the Ancients 'tis called, *Cingulum Mundi*, the *Girdle of the World*; and also the *Equinoctial*, because those that live under it have always their Days and Nights both of a length, and so have we, and almost all the World, twice a year, when the Sun holds this Circle, entring the beginning of *Aries* or *Libra*, which are called *Equinoctial Points*, or *Signs*, for that reason; and the *Times*, the *Vernal*, or *Autumnal Equinox*.

Equation.

Equation, A term used much in *Algebra*, and often in *Astronomy*, as to affirm such and such Numbers, or Letters, are Equal to others found out by Operation. And in *Astronomy* 'tis used for Proportions sometimes; and Equating or Regularizing time from the *Sun's* Irregular Motion as to us, in Regard of the *Obliquity* of the *Ecliptick*, as Authors very well demonstrate.

To Erect a Figure, or draw a Scheme, Is only to divide the 12 Houses aright, and put down the proper Sign, Degree, and Minute on each Cusp, and the Planets in their proper places; so that your Figure may truly represent the Positions of the Celestial Bodies at that moment of time for which it is intended. See *Fig. 2.*

Errones, or **Erratick Stars,** [A Latin word that properly signifies *Wanderers*] The Planets are usually called so, in contradistinction to the Fixed Stars, by reason of their having each a peculiar Motion, and divers respects to each other, which by such Motion they daily change; whereas the Stars of the several constellations, though hurried daily round from East to West by the *Primum Mobile*, and back again by a most slow and imperceptible Motion of the Firmament; yet because themselves move not, but retain always the same place in the Firmament, and distance from each other, they are justly reputed, in respect of the others, Fix'd and Immovable: But these *Erraticks* or *Wanderers*.

Essential Dignities, Certain real Advantages whereby a Planet is fortified: as when he is in his House, or Exaltation. See *Dignities*, and a Table of them always in Mr. *Lillie's* Almanack.

Eudemou, [In Greek, *Eu* signifies Good, or Well;

Well; and *Damon* a Spirit] The ~~Good~~ *Gemin* or *Spirit*. The 1th House of a Celestial Figure is so called, by reason of its good and prosperous Significations; as, store of Friends, Attainment of Hopes, &c.

Even Number, Is that which may be divided into two parts; as 4, 10, 40, &c. are *Even Numbers*, forasmuch as each of them may be divided into two equal parts, whereof their halves are 2, 5, 20, &c.

Evenly Even, Is that which an Even Number doth measure by an Even Number; as 32 is said to be a Number Evenly even, because 8, an Even Number, doth measure it by 4, which is likewise an Even Number.

Evenly Odd, Is that which an Even Number doth measure by an Odd Number; as 30, which 2 or 6, Even Numbers, do measure by 15 or 5 Odd Numbers.

Ebolation, Vide *Appendix*.

Exagonum, [From the Gr. *Gonia*, an Angle, and *Hex*, six] A Figure consisting of six Angles, but in Astronomy a *Sextile Aspect*. Hence see *Hexagon*.

Exagonal, Of or belonging to such a Figure or Ray. 'Tis sometimes written *Hexagonum*.

Exaltation, Lat. An Essential Dignity of a Planet, next in vertue to being in his Proper House. Or a place where a Planets Influence is always observ'd to be very strong; which is, where a Planet of a contrary nature is very weak: As *Sol*, the Fountain of Light, in *Aries*, which is the Fall of *Saturn*, a Lover of Darkness; *Jupiter*, Author of Justice in *Cancer*, where *Mars* the Master of Misrule is in his Fall, so ♀ in *Virgo* the Fall of

Venus.

Enns; one signifying Science and Study, the other only Mirth and Pleasures, &c. Thus, *Al-*
man for an Antient Astrologer in his *Aphorisms* to
 the King of the *Saracens*.

Exhalations, Lat. Vapours drawn up from the
 earth or Sea into the Air, whereof are genera-
 ted all kind of Meteors, as Rain, Hail, Snow,
 Thunder, Lightning, Comets, Falling Stars, &c.

Extraction of Roots, *Radix*, or the Root, is the
 de of a Figure, or a Number which being multi-
 plied in it self, makes the Powers of that Num-
 ber. And the *Extraction* is but the unravelling
 of a Power (or Number proposed as a Power) to
 find the Root.

Hence the Extraction of the *Square Root* is the
 finding a Number, which being multiplied in it
 self, shall make a proposed Number.

And the Extraction of the *Cube Root* is the find-
 ing a Number, which being multiplied twice in it
 self, may equal a given Number.

Also the *Extraction of a Biquadrate Root*, is by
 the untwisting of a given Number to find another,
 which being multiplied in itself, and again that
 product in it self, may make the first given Num-
 ber, &c.

Extream Reason, A Right line is said to be
 divided according to mean and Extream Reason,
 when as the whole is to the greatest Segment, as
 the greatest Segment is to the lesser. See the De-
 monstratation in *Eucl. Elem. 6. Def. 3.*

Exuberant Body, Lat. A swelling Body, or
 bulging out, as the knobs on Galls are *Exube-*
rant.



Face, The third part of every Sign ascribed to some Planet, who as therein one Essential Dignity. See *Decanate*.

Fall, The *Fall* of a Planet is the Sign opposite to that wherein he is Exalted; in which he is said to suffer 4 *Debilities*.

Face of the Bulwark of a Battalion, &c. Or of a Battalion: common Terms in Fortification and Military Discipline. See Sir *Jonas Moore's Works* and others.

Feral, [or Beastly.] From the Lat. *Fera*, a wild Beast. The Signs so called are Ω , and the latter part of τ . Not only because they are called and painted as wild Beasts, but because they have really some kind of Savage Influence, and give fierce and cruel Manners to a native born under them especially if the Luminaries be therein, and the Malevolens in Angles. The Moon is also said to be *Feral* by some Authors when she is *void Course*, that is, has separated from one Planet and applies to no other whilst she remains in the same Sign.

Fere, See *Goldman's Dictionary*.

Figure, Is defined by *Eucl. Lib. Def. 14.* to be a quantity included under such or such terms or bounds. As a Plain Figure, a Spherical Figure, &c. But in Astrology 'tis taken for the Scheme or Draught of the *Face of Heaven* at some determinate time.

Figurate Number, Is a Number made by the multiplication of one Number or more by another.

Fiery Triplicity, Are such Signs of the *Zodiack* excell the rest in Fiery Qualities, viz. Heat and Dryness, which are Ω , γ , and τ .

Fly. See use of *Mathematical Instruments*.

Flux and Reflux of the Sea, or the Ebbing and flowing thereof.

Flank, A Term in Fortification and Military discipline.

Fraction, From the Latin, *Frango*, to break. A broken Number expressing so many parts of a whole, as $\frac{2}{4}$ two fourths, that is, one half of any thing.

Frigid, [or Frozen] Zones, the space between the Poles of the World, and the Arctick and Antarctic Circles respectively, imagined by the ancients, to be altogether uninhabitable, because of its excessive Cold.

Finito, [From the Lat. *Finis*; the Bounder or end.] The Horizon or great Circle dividing the upper Hemisphere from the lower, is so called; because it bounds our Sight, which conceives that here the Earth and Heavens meet.

Firmament, The Eighth Orb, or Heaven of the fixed Stars.

Fixed Signs, Are φ , Ω , $\mathfrak{m}$, and $\mathfrak{w}$, so called, because the Sun passes them respectively in the middle of each Quarter, when that particular season is more settled and fix'd than under the Sign it begins or ends it. Thus the Spring wholly prevails when the Sun's in φ . Summer when in Ω . Autumn when in $\mathfrak{m}$. And Winter when in $\mathfrak{w}$. Besides their Nature and Influence tends more to stability and Duration, as may be observ'd in the growing of Trees, Buildings, &c.

First Mover. See *Primum Mobile*.

Focus,

Focus, The navel or 2 Centre points to draw the curv'd Figure, called an *Elipsis*, much like an Oval Figure in form.

Fortification is also called *Military Architecture* Regular, and Irregular: The Art of Fortifying Town, to Defend it against an Enemy.

Forestaff, or Crossstaff, An Instrument us'd for observing the Sun or Stars, &c. with ones face towards the object.

Fortitudes, [From the Lat. *Fortitudo*, strength] Certain Advantages which Planets have to make their Influences more strong, by being so or so Posited, Qualified or Affected. See *Dignities*.

Fortunes, The two benevolent Planets ♀ and ♄, by reason of their kind and friendly Nature are generally so called. As ♀ and ♄ for a contrary Nature, are called *Infortunes*.

Fruitful, [or Prolifick] Signs, are ♋, ♌, ♍, and ♎. The meaning is, if one enquire if he shall have Children, and the Moon and principal Significators be in any of these Signs, and strong, there is no doubt but he will have Issue.

Frustum, A Latin word signifying a Bit, or Piece cut off, or separated from any Body: As the *Frustum* of a Cone is a part or piece thereof. See *Segment*.

Frustration, [From the Lat. *Frustrum*, to prevent, or make void.] Is a kind of *Debility* which happens to a Planet when he is applying to the Conjunction of another, being within Orbs; but before they are Corporally joyn'd one of them becomes *Retrograde*, and so he is *frustrated* of his End.

Fulgens, Shining, Glistering.

Fundamental Diagram, Or a Projection of a Sphere in *Plano*, &c.

Furlong, The Eighth part of a Mile, or Forty Rods.

Furniture of a Dial, Such are the Parallels of Declination, Length of the Day, Azimuths, or Points of the Compass; the Planetary Hours, *Babylonish* and *Jewish* Hours, &c. for Ornament.

G

Gage, or **Gauge-point,** is a Term in Gauging, I discours'd by most Authors. See *Sturmy*, book 5. Fol. 24. and most Authors of that Subject.

Galaxia, [A Greek word, from *Gala*, *Golactos*, Milk.] See the Milky way.

Gemini, A Latin word signifying Twins.] The third Sign in order of the *Zodiack*, the House of *Mercury*, Common, Airy, and Humane. And note this Constellation of Π like the rest, is gone back out of it's place in the 8th Sphere since *Proton*'s time, and begins at 25Π , and is extended to the 25 of *Cancer*.

Genethliacal, The first a Greek, the second a Latin or **Geniture**, both signifying the Birth or Nativity of a Man, but more used for the Figure of Heaven, artificially erected for that moment of time, when an Infant is brought into the World. Hence **Genethliacal**, of or belonging to such Geniture or Figure.

Geocentrick, [From the Greek *Ge*, the Earth, and *Centron*, the Centre.] Any Planet or Orb that has the Earth for its Centre, or the same Centre with the Earth, Geoc

Geodesia, Gr. The Art of Measuring Land, or Surveying.

Geography, [From the Greek *Ge*, the Earth, and *Grapho*, to write or describe.] A description of the habitable World, or a general Survey of the whole Terrestrial Globe, containing the Situation of all Countries and Continents, distance of Places each from other, &c.

Geometrie, [A Greek word, from *Ge*, the Earth, and *Metron*, measure,] signifying no more, in a strict sense, but *Measuring of the Earth*; and therefore was anciently used for the two words last explained; but now it has been long appropriated to the most noble of all the Mathematical Sciences. The Consideration of *Continued Quantity*, or Sensible Magnitudes, whose parts, though never so vast or remote, by its Demonstrations are understood and exactly measur'd; so that indeed it has the whole Universe by its Object. And therefore the profound Dr. Dee would rather have it called *Megethologia*, (from the Greek *Megethos*, Magnitude, and *Logos*, Speech or Reason) that is, the consideration of Bulk, or all kinds of Magnitudes, rather than that narrow unfixt name of *Geometry*: Of which there is two Sorts, *Practical* and *Speculative*; of both which, Authors do treat very copiously in several Languages.

Geomancy, An Art that teaches to resolve Questions and foretel things to come, by certain Circles or pricks made in the Earth; but now it is performed somewhat after the manner of *Astrology*, by Figures on Paper. See Cottons Book of this Art. 'Tis derived from *Ge* and *Mantia*, A Divination, whence also comes *Necromancy*, and other the like words.

Given

Stiver of Life. See *Alcochoden*, or *Hylech*.

Globe, Is properly, *A solid Body, exactly round, contained under one Surface*; such as the Bodies of the Planets, the Earth, &c. But the word is now usually attributed to Two Artificial Representations of Heaven and Earth; of which, one called the *Celestial Globe*, shews the several Constellations and Stars, the Circles, Longitudes, and Latitudes of each part of Heaven, fitted with their Horizon and Meridian to every Elevation of the Pole, &c. The other nam'd the *Terrestrial Globe*, discovers on its Surface the Description of the whole Earth and Sea, with its Meridians and Parallel Circles, &c. whereby the Longitude, Latitude, and Distance of Places from each other, may be presently understood.

Gnomon, [A Greek word, signifying a *Shewer*, or *Discoverer*, but used for] the *Pin*, or *Cock*, or *Style* of a Dial, the Shadow whereof pointeth out the Hour. Hence it is called the *Stile* or *Gnomon*; and this last word is used also in Extraction of roots. See *Euclids Elements*.

Gnomonice, The *Art of Dialling*, or that part of Astronomy, which by the Shadow of the Sun, and sometimes the Moon, artificially made, measures their Course, and the space of Time, in hours or otherwise, which elapses during the same, and plainly exhibits it to our view.

Golden Number, (so called, because for its great use it was yearly set up publicly in Golden Letter) Is an Artificial Revolution of a Nineteen Years Circle, distributed for the years following from One to Nineteen, and then beginning again. To find the Golden Number, add one to the year of our Lord, and divide by 19, the Remainder

is it; but if none remain, then 19 shall be the Golden Number. It was first invented to find out the Lunations and Moveable Feasts; but at this day 'tis very insufficient: and therefore *Origanus* merely says, since it will no longer perform its business without gross error, instead of Golden, he call it the *Leaden Number*.

The Golden Rule, The Rule of Three is so intitled, by way of excellency in Arithmetick teaching from three Numbers known, to find out a Fourth unknown, performed by multiplying the Third Number by the Second, and dividing the Product by the First, the Quotient gives the Fourth Proportional Number sought for.

Gorge, Is a Term in Fortification belonging to a Fort or Battery, upon which to Plant Guns to defend the place, from the Assault of an Enemy as all Authors thereof plainly demonstrate.

Great Circles, Are such as divide the Sphere or Globe into Two equal Parts, and are commonly accounted Six in number; viz. the *Horizon*, the *Meridian*, the *Equinoctial*, the *Ecliptick*, and the two *Colures*.

Great Circle-Sailing, Which directs a Ship to the nearest Course between two places, in the Arc of a Great Circle, would the Winds favour keep therein.

Gregorian Year, The New Account, or New Style, instituted upon the Reformation of the Calendar, by Pope *Gregory* the 13th. (from whence it takes the Name) *Anno Domini*, 1582. where ten days being then taken out of the Month *October*, the days of their Months go always ten days before ours, as their 11th. is our first day. Which New Style or Account is used in most parts beyond

beyond the Seas, and does much better agree with the Solar Year, but yet not exactly. How to do it infallibly for ever, see a small Treatise, Intituled, *The Jewish Calendar explain'd*, written by *H. Care*, and some years since published.

Gravity, The Centre thereof, is a Term in *Mechanicks*, and is a point upon which the weight of a Body (or Ponderosity) bears, or is equally poiz'd, as you may read in Authors that treat of *Mechanicks*, viz. of the use of the *Wedge*, the *Screw*, the *Pully*, the *Leaver*, &c. See *Dr. Wallis's Lectures of Mechanicks*, &c. *Lat.*

Gunter's	{	Chain,	}	All useful Mathema-
		Quadrant,		tical Instruments, in-
		Rule,		vented, or much im-
		Scale, and		proved by that fa-
		Sector.		mous Mathematician

Mr. Edmund Gunter, sometimes Professor of Astronomy in *Gresham Colledge, London*, and from him bearing their Names. The Descriptions and several Uses of all which, being not to be declared in a few words, and already set forth by himself, I shall thither refer the *Philo-Mathematick Reader*.

Gyre, A whirling Motion, or swift Turning round, such as we see in the Flie of a Jack, &c. The word is Originally Greek, but used in Latin in the same sense.

H

Hale or Haloe, A Circle about the Sun, Moon or Stars, with a seeming brightness like Rays, being thick Vapours, not resolved, but gathered together into that part of the Air above which the Star is, and so inlightned by its beams, appear like a bright Ring round about the Body of the Sun or Star. See *Parhelia*.

Harmony, A word proper to Sounds that are made in that kind of proportion, *viz.* Harmonical, which is different from that of Arithmetical and Geometrical proportion, which is illustrated by most Authors of Arithmetick, and in particular; consult *Blundevil's Exercises*, who is very copious in this kind of proportion.

Hayz, An *Arabian* word, used in Astrology, to signifie a certain Dignity or strengthening of a Planet, by being in a Sign of his own Sex, and a part of the World agreeable to his own Nature; as when a Masculine and Diurnal Sign is in the day-time above the Earth, and in a Masculine Sign; Or a Feminine Nocturnal Planet, in the Night, in a Feminine Sign, and under the Earth: but if he be only in a Sign of his Sex, and under the Earth in the day-time, being a Diurnal Planet, then he is said to be in his Light, but not in *Hayz*.

Heart of the Sun. See *Cazimi*.

Height of a Figure, Is the Perpendicular Line drawn from the Top of the Base. See the Explanation in *Eucl. Elem. 6. Def. 4.*

Height,

Height of the Pole, See *Elevation of the Pole.*

Heliacal Rising, [or a Rising of a Star from the Sun] Is, when a Star having been under the Sun's Beams, gets from the same so as to be seen again. And **Heliacal Setting** is, when a Star, by the near approach of the Sun, first becomes inconspicuous. This is reckoned in the Moon but at 17 Degrees distance, or thereabouts; but in other Stars, tis as soon as they get distant, or comes near the Sun by the space of a whole Sign.

Helicosophie [From *Helix*, a Spiral-Line, and *Sophia*, Wisdom, Craft, or Skill] An Art Mathematical, which demonstrateth the designing of all Spiral-Lines in *Plano*, on Cylinder, Cone, Sphere, Conoid, and Spheroid, and their Properties appertaining. The use whereof in Architecture, and divers Instruments and Engines is most necessary; for in many things the Screw worketh the Feat, which else could not be performed.

Heliocentrick Longitude or Aspects, so called, as arising from *Helios* or the *Sun*, Respecting the *Sun*, the Centre of the Universe, according to the *Copernican system* in Astronomy, &c.

Helix, A Greek word signifying a winding Spiral Figure, or a crooked Line, which is unequally distant from the midst of the space, however inclosed.

Hemisphere, [half the Sphere] generally taken for one of the two parts made by the Horizon, dividing the Heavens into two Segments, whereof one is always conspicuous to us, the other not to be seen.

Heptagon, [From the Greek *Hepta*, seven; and *Gonia*, an Angle] A Figure of seven Angles

whence *Heptagonal*, an Adjective, of or belonging to such a Figure.

Heteroscii, A Greek word, often used amongst Cosmographers, which signifies only, People that have their shadows cast but *one way* at Noon, such are we *English*, and all the Inhabitants of the Temperate Zones, viz. on either side the Equator, from the Tropicks to the Arctick and Antarctick Circle; our Shadow at Noon being to the North, theirs to the South: Whereas they that live between the Tropicks, cast their Shadow now one way, and then another, and once a year have no Shadow at all at Noon, the Sun being Vertical, or right over their heads.

Hexagon, or *Hexagonon*, A Figure that consists of six Angles, or a Sextile Aspect. From *Hex* six, and *Gonia*, an Angle.

Heterogenial, Of a different kind, not alike, nor of the same nature; from the Greek *Heteros*, another, or different; and *Genos*, a Kind or Race.

Holometrum. [The General Measure, or Measure of the whole] A Mathematical Instrument, for the easie Measuring of any thing; invented by *Abel Tull*, who published a Book of its use. 'Tis derived from *Holos*, the whole, and *Metron* Measure, in Greek.

Homocentrick, Having the same or a like Centre. See *Concentrick*; from the Greek, *Homos*, alike and *Centron*, a Centre.

Homogeneal, [From the same *Homos* and *Genos*] Of the same kind or sort, alike, that which differs not in Nature, agreeable, &c.

Homologal, Agreeable, or alike to one another in Reason: As when we say, There is the same reason of A to B, as of C to D. Here A is Homologal to B, and C to D.

nological to C, as B to D, because of the similitude between Antecedents and Consequents.

Horary Question, A Question ask'd at a certain Hour. 'Tis a Term used in Astrology, when one goes to an Artist, and propounds a Question to him, he presently erects a Figure for that Hour, in which you declare your mind, and from the face of Heaven at that time, pretends to resolve you. A Horary Question being the Birth or Delivery of the Mind, as a Nativity of the Body; and if it be Radical, and soberly ask'd of a discreet Artist, there may be no contemptible satisfaction obtained by it.

Horizon, [From the Greek word *Horizen*, to Bound, Enclose, or Terminate] A great Circle in the Sphere, so called, because it bounds our sight, and divides the upper Hemisphere, or part of the Heaven which we behold, from the other lower part, which is inconspicuous. More plainly, It is the Circle where the Heavens and Earth seem to meet, as far off as you can see when you turn your self about at Sea, or in an open field: And above which, when the Sun or any Star comes, 'tis said to Rise; when it goes below it, to Set. But yet more particularly, the Horizon is to be considered two manner of ways.

First, the Natural Horizon.

Secondly; the Mathematical Horizon.

The first is that apparent Circle we have just now described. But the second, which is oftner made use of in the Doctrine of the Sphere and Astronomy, Is a great Circle which divides that part of Heaven which we call above us, from that which is counted under us, precisely into two equal parts, whose Poles are the *Zeniths* and *Nadir*;

dir; and in which Circle, the *Azimuths*, or Vertical Circles are numbred; and likewise by it our Days and Nights measured out unto us; for whilst the Sun is above the Horizon, it is Day; and when under, Night.

Horizontal Line, Any Line drawn parallel to the Horizon, upon a Plain, or Dial.

Horizontal Projection, A Projection of the Sphere in Arches of Circles, called *Stereographick*, wherein the Sphere is pressed into the Plain of the Horizon, and the Meridians and Parallels of the Sphere projected thereon.

Horologiography, The Art of Making, or Treating of Clocks, Dials, and other Instruments to tell the time of the Day. From *Horologium*, a Clock or Dial; and *Grapho*, to write or Treat of.

Horometrie, [From the Greek, *Hora*, an Hour, and *Metron*, Measure] The Art of measuring or Dividing Hours, and keeping Account of Time.

Horoscope, [From the Greek, *Horos*, the utmost bounds of a thing, and *Scopeo*, to view, watch, or look abroad as far as one can.] The Angle of the East, or that part of Heaven which Arises every moment from the lower Hemisphere to our sight, exactly East, the Ascendant, or first House; but more properly, the Sign and Degree on the Cusp of that House. And since the same has a very great signification of the Constitution, Corporature, and Manners of a Native, 'tis used in Authors sometimes for the General Fate of Man's Life. It differs, as you may perceive, from Horizon, because that is the whole Circle round about, this only that point of the Ecliptick which lies in the East.

Hour Circle, Is part of the Furniture of a Globe being a small Brazen Circle fitted on the Meridian

whose

whose Centre is the Pole of the World, divided into 24 Hours, which in a Revolution of the Globe, are all pointed at with an Index for that purpose, fitted on the Axis of the Globe. See my *Tutor to Astronomy*, p. 6.

Houses of Heaven, A Twelfth part of the Heavens, considered in the situation of the World, is called a House. For Astronomers divide the whole Sphere into four equal parts, by the Meridian and Horizon, and each of these Quadrants into Three other parts, thereby making Twelve Divisions of the whole, which are called *Houses*, which are reckoned in order, contrary to the Motion of the *Primum Mobile*: As, the first House is the Horoscope; the second, not that which the Stars come to next above the Earth, but that towards the North, under the Earth. Of the reason for this division of the Heavens, and why such a particular Signification is ascribed to each House, see *Morinus* in *Astrologia Gallica*; or that exquisite Tract by Mr. Coley, in *English* called, *The Key to Astrology new Filed*.

Hugroscope, A Glass, foretelling Droughth and Moisture, by Mr. *Flamsted*.

Humane Signs, Are counted amongst Astrologers not only those Signs of the Zodiack, which have, as it were, the form of Man, *Gemini*, *Virgo*, *Aquarius*, and the first half of *Sagittarius*; but also such Asterisms without the Zodiack, as are usually represented in humane shape, as *Perseus*, *Andromeda*, *Cassiopea*, *Cepheus*, *Orion*, &c. It being found by experience, that the same were not either casually or fantastically ranged in such Figures, by the wisdom of the Ancients, but by reason of a certain Affinity, Connexion, or Sympathy

pathy which they had with Mankind. Hence that common Axiom in Astrology, *The meeting of the Infortunes in a Humane Sign, especially in the 8th. House, causes the Pestilence, and great Mortality amongst men.* And that of Ptolomy, in Centiloquio, *Whoever has neither the Lords of his Geniture, nor the Ascendent, in Humane Signs, will himself be a stranger to Humanity, or of churlish savage behaviour.*

Hydrography, [From the Gr. *Hydor*, Water, and *Grapho*, to Write or Treat of] An Art conversant in the Description and Measuring of the Sea, or great Waters; teaching how they may be Sail'd, or pass'd over with greatest conveniency; the Nature of Bays, Rocks, Shelves, Counter-Tides, Soundings, and other Remarkables on the Coasts; what Winds they lie obnoxious to, how far in a Right Line one Port is from another, &c.

Hyleg, or **Hylech**, An *Arabick* word, signifying, The Giver of Life; A Planet, or part of Heaven, which in a Man's Nativity, becomes, in an Astrological sence, the Moderator or Significator of his Life. Hence

Hylegiacal Places, Are such, as when a Planet happens to be posited therein, he may be said to be *Hyleg*, or fit to have the Government of Life attributed to him; which places are generally reckoned five, *viz.* The Ascendent, the Mid-Heaven, the 7th. House, the 9th. and the 11th. House. Also the *Sun*, *Moon*, and *Part of Fortune*.

Hyperbola, **Hyperbolical**, A curved Figure used in solid Geometry. See Mr. *Anderson's Stereometrical Propositions in English*, to be had at the Black Raven near to St. Andrews Church in Holborn.

Hypobasine, A Term in Algebra.

Hypogeon,

Hypogeon, [under the Earth, from the Greek proposition, *Hypo*, under, and *Ge*, the Earth] but especially the 4th. House, or *Imum Cœli* is so called.

Hypotenusa, [A Greek word, properly signifying, A Line drawn under] but used by Geometricians, when a Right Line is drawn under two Right Lines, that make a Right Angle, and of which one is bigger than the other, then the Line subtended (or *Hypotenusa*) must needs exceed each of them in length. As in Fig. 5. the Line BC is the Line *Hypotenusa* to the Line AB and AC.

Hypothesis, Gr. A Supposition, a Sentence laid down, and taken up for granted for Arguments sake, or to be discoursed of. So the several Models of the World conceived and delivered by *Ptolomy*, *Copernicus*, *Tycho*, &c. are called such an one's *Hypothesis*.

I

Jacobs Staff, A Mathematical Instrument for taking Heights and Distances. See *Cross-staff*.

Ichonography, [From the Gr. *Ichnos*, a Pattern, and *Grapho* to Write] The Art of making of Models of Building, a Plat-form, the Plot of a House to be built, drawn out on a Paper, describing the Form of all the Rooms, Lights, Chimneys, &c. according to which form the Workman goes to work. See *Vignola's Compleat Architect*, in the Preface.

Icosaedron, Gr. A solid Figure, contained under

der twenty Equal and Equilateral Triangles. This is one of the five sorts of Regular Bodies ; so called, because all the Plains wherein they are contained are Equal Equilateral and Equiangular. They are by some term'd *Platonical Bodies*, because *Plato* in *Timæo*, compares the Simple Bodies of the World, Fire, Air, Water, Earth, and Sky, to these. The other four are, *Cube*, *Tetraëdron*, (or four *Triangles*) *Octaëdron*; (or eight *Triangles*) and *Dodecaëdron* (or twelve *Triangles*.)

Ides. See *Calends*.

Ignis Fatuus, [Lat. A foolish fire] A Jack with a Lanthorn, or Will with the Wisp. An Exhalation or Light, frequently seen in Meadows, Church yards, &c. supposed to lead people out of the way; by reason of its irregular skipping up and down, (as fools use to do) according as the Air is agitated, 'tis called *Fatuus*.

Impure Logarithm, Or a *Defective Logarithm*, or the Logarithm of less than Unity.

Imum Cœli, [Lat. the bottom of Heaven.] The fourth House in a Figure of the Heavens, called also *Fovea*, [the Ditch,] and Angle of the Earth.

Incidence, [Lat. A falling upon] the place where two Lines or Rays meet, or light one upon the other.

Inclination, [Lat. A bowing downward, or leaning awry] but when we speak of the Inclination of a Planet, we mean its motion towards such or such a point in Heaven.

Incommensurable Quantities, are those which have no *Aliquot* part, or any common measure that may measure them : As is the Diameter of a Square, and the Side of the same Square. For

although

although that each of those Lines have infinite *Aliquot* parts, as the half, the third, and other parts; yet not any part of the one, be it never so little, can possibly measure the other; as is demonstrated, 10 *Elem. Propos. 117.* by *Euclid*.

Increase'd in Number, [*Auctus Numero*, in Latin.] A Planet is said to be so, when by his proper motion he exceeds his mean motion. See *Swift*.

Index, [Lat. A Shower or Discoverer.] The Table of a Book. In *Musick D. Sol. Re.* in the *Gamut*. The longer piece of Wood of the two in a *Jacob's Staff*. In a *Globe* 'tis a little Ruler to be put upon the Pole, pointing out the time on the Hour-Circle.

Indiction, Lat. the space of fifteen years, in which space the *Roman Tribute* throughout all the Empire being Indicted, that is, appointed and limited to be paid in, they therefore used to reckon and date their Writings such a year of the *Indiction*. To find this year of the *Indiction* for any year of our Lord, Add 3 to the year of our Lord, and divide by 15, what remains besides the Quotient, is the year of the *Indiction*; if nothing remain, then 'tis 15.

Indivisible, A Term in Speculative Geometry, shews the thing cannot be divided; the same in effect with *Euclid's Incommensurables*.

Unfortunes, *Saturn* and *Mars* are so called, because of their malevolent Natures, and unfortunante Influences.

Informed Stars, [that is, without form.] Such of the Fixed Stars as are not cast into, or ranged under any Constellation, or form. See *Parades*.

Ingress,

Ingress, Lat. An Entrance upon, or going into; 'tis used chiefly in Astrology, for the Sun's entring the first Scruple of one of the four *Cardinal Signs*, especially *Aries*, which they account the Annual Revolution of the World.

Inordinate. See (*Ram.* 37.)

Inscribed Bodies, Is the 5 Regular Bodies.

Inscribed Figure, *Eu.* 4. Def. 1.

Integer; [Lat. Whole, Entire, or Compleat.] In Arithmetick a whole Number: As one pound, whereas $\frac{4}{4}$ four fourth parts of a pound signifies the same thing, and is only a way of expressing that *Integer* by Fractions.

Intercalary day, [From the Lat. *Inter*, between, and *Calo*, to call, or insert.] The odd day put in, or inserted in the Leap year, whereby the 6th *Calends* of *March* (that is with us the 24th of *February*) was reckon'd twice.

Intersection, A cutting off, a chopping of one Line upon, through another. From *Inter* between, and *seco*, to cut.

Interruption. See the *Appendix*. Also the Term *Involution*, at the end of this Book.

Inverse. See *Transposed Reason*.

Ionick, From *Ionis*, a Province in *Greece*. One of the Five Orders of Architecture; or Artificial modes of Building, there first practised. See *Vignola's Compleat Architect*, p. 38.

Jove. See *Jupiter*; *Jovis* being only the Genitive Case thereof.

Jops of the Planets, Are certain Dignities happening to them, either by being in the place of a Planet of like Condition and Nature, as the *Sun*, in houses of *Jupiter*, *Saturn* of *Mercury*, *Venus* of the *Moon*, &c. or in a house of the Figure agreed

agreeable to his own Nature. Thus ♄ delights in the 12 House, ♀ the 11th, ♂ in the 6th, ☉ in the 9th. ♀ in the 5th, ♄ in the Ascendent, and the Moon in the third.

Iris, Greek, The Rain-bow, called also by the Ancients, the Daughter of *Thaumatis*, that is, Wonder, from the admirable variety of Colours therein.

Irrational Lines, Such as are Incommensurable to a Rational Line supposed in Length and Power, and not in Length only. So **Figures** Incommensurable to the Rational Square, may be called **Irrationals**, or *Surds*. In like manner the Reason that is between Quantities Incommensurable, is called *Irrational Reason*. For further Light, see the word **Reason**.

Isagon, A Figure consisting of equal Angles; From the Gr. *Isos*, equal; and *Gonia*, an Angle.

Iso-perimetroe, From the same *Isos*, and *Perimetros*, a Circuit. Figures that have equal Circumference, or Contents.

Isoceles, [A thing of equal shanks.] A triangular Figure in Geometry, having two sides only equal, but the third bigger or lesser than either of them.

Julian Year, The old Account instituted by *Julius Caesar*, which to this day we use in *England*, in contra-distinction to the New Account, framed by Pope Gregory.

Jupiter, [The *Genitive Case* in *Latin* being *Jovis*, we often call him *Jov* in *English*.] One of the seven Planets, placed above *Mars*, and next to *Saturn*, he is counted the greater Fortune, being of a benign temperate nature, and makes his Revolution in about 12 years, and 312 days, having the

By *Galileus* and others assisted with the *Telescope*, notice has been taken of four Stars guarding and waiting upon this Planet's Body, in several *Epicycles* observing him for their Centre; being now further off, now nearer to him, sometimes hidden by him, &c. and yet their motion not equal; for one of them is observed to Compleat its Revolution in one day and about 18 hours, the second in three days and almost 13 hours, the third in seven days and 4 hours, and the last in sixteen days and 18 hours. Some say this Planet is called *Jupiter*, as if we would say, *Juvans Pater*, an *Helping Father*, by reason of his kind Influences.

K

Kalends. See *Calends*.
 Kalendar. See *Calendar*.
 Kacotyche, [Gr. Evil Fortune.] The Sixth House of a Figure is sometimes so called, from its bad significations; as *Diseases*, &c. and being the most Abject part of Heaven.

Knot, Every Log-line should be divided into parts, and every of those Divisions are distinguished by *Knots*, which ought to be 50 Feet asunder, and this Line is frequently used by Sea-men with their *Log*, mentioned in its proper place.

L Latitude.

L

Latitude; [Breadth or Width.] A Term used both by Astronomers and Geographers.

In *Astronomy*, 'tis the space that any Planet, or other Star does, or can wander from the Ecliptick towards either of its Poles: And as this deviation is either towards the North, or South, so it takes the denomination of North or South Latitude. Note, the Sun going on always in the very Ecliptick, can never have any Latitude, nor can be above 9 degrees in any other of the Planets; but in fixed Stars it may be greater and greater, even to 90 degrees, that is, to the very Poles of the Ecliptick. Nor did the Ancients think it could be above 6 degrees in any Planet; but experience in ♂ and ♀ proves the contrary.

In Geography, the distance of the Equator from the Vertex (Zenith or Point of Heaven right over Head) of any Countrey or City, is called *The Latitude of that Place*; or more plainly, 'tis *An Arch of the Meridian comprehended between the Equator and the Place enquired after*; numbred on the Meridian from the Equator both ways, viz, North and South, till it comes to the Poles or 90 degrees; and agrees with the Elevation of the Pole above the Horizon; as the Elevation of the Equator above the Horizon agrees with the distance of the Pole from the Zenith.

Legs, in Trigonometry, signifies the shortest Sides in a Right Angled plain Triangle.

G

Lemma;

Lemma, A Greek Word that signifies an Assumption, or the Title or Argument in a Mathematical Author of what he intends to Treat.

Leo, [Lat. The Lion.] The fifth Sign in the Zodiack, thus characteriz'd ♌. 'Tis the House of the Sun, who therein causes the greatest heat being of the fiery Triplicity, hot, dry, and barren, and therefore was called *the Lion*, for the resemblance it had to the nature of that Royal Animal.

Level, An Instrument used by Carpenters and other Mechanick Artificers, called in Latin *Libra* or *Libella*, a Ballance : The use of it is for the trying or examining of a Plain or Floor, whether it do lye parallel to the Horizon or not : As the Plumb-rule is for trying of an erect Perpendicular, as a Column-Pillar, &c. whether it stand right or not.

Libra, [Lat. The Ballance.] One of the Signs exactly opposite to *Aries*, thus mark'd ♎, and called so, because when the Sun enters thereinto he makes the days and nights even, as if they were pois'd in a pair of Scales. 'Tis the House of *Venus*, and Exaltation of *Saturn*, Airy, moveable, hot, moist, &c. *Ptolemy* observes that persons born under this Sign, are of good Countenances and pleasing Manners ; but for the most part, the cause of their own deaths.

Light of the Time, Is the Sun in the day-time and the Moon in the night : For so we know they were Originally appointed, *the Sun to Rule by day and the Moon by night*.

Light, A Planet is said to be *Light*, that is, nimble or quick, compared to another that moves slower : As the Moon in respect of all the Planets.

The Sun in regard of the 3 Superiors. But absolutely the 3 Inferiors, *Venus, Mercury*, and the *Moon*, are called *Light*, and the Superiors *Ponderous*, [or heavy,] because generally their Diurnal motion does not exceed that of these; though sometimes when ♄ and ♃ are retrograde or stationary, the Superiors move faster than they.

Limbus, [A Latin word signifying a Border, or Fringe,] used by Astronomers for the outermost Limb of an *Astrolabe*, or the like Geometrical Instrument, in the Planet whereof are inscribed the hours and degrees thereunto answering, the names of Winds, &c.

A Line, Is a Length void of Breadth, or as others define it, the Flux of a Point conceived to move from place to place; Length being the proper difference of a Line, as Breadth is of a Superficies, or Solidity of a Body; yet is there not such a Line without Breadth in any material thing. But as the point, so the Line which we draw, is the Sign of that which we Conceive in mind: For if the point which we Conceive be moved, and leaveth an Imaginary Tract, that shall be a Line; Long, by reason of the motion, but not Broad, because the Point from whence it proceedeth, is void of all Extension.

Line of Defence, A Term in Fortification.

Line of Numbers, Lines, Chords, Tangents, Secants, Sines, Versed Sines, &c. now in great use, which you may consult Mr. *Gunter's Work*, a book well known to all Mathematicians.

Line of Incidence, A Ray starting from some luminous Body, and ending on a Point of some superficies; the knowledge whereof is chiefly necessary

cessary for finding out the Greatness and Duration of an Eclipse.

Line of the mean Motion, A Right Line terminating the mean motion or place of a Star, which in an Epicycle is imagined to be drawn from the Centre of the World to the Centre of the same Star; but in the Eccentrick, from the Centre of the Eccentrick, by the Centre of the Star to the Ecliptick.

Lineate. See *Ramus, Lib. 8. Prop. 21.*

Logarithms, [Derived from two Greek words *Logos*, Reason, and *Arithmoi*, Numbers,] Are *Artificial Numbers* invented by Arithmeticians, to the end that being put in the place of Natural Numbers, they may be fit to manifest what Progressive difference there is in them: For they always keep in themselves the same Progression Arithmetical, as those in whose stead they are Constituted, do Progression Geometrical. Hence it comes to pass, that when 4 Numbers have proportion one to the other, the Sum of the Logarithm of the first and last shall be equal to the Sum of the 2 middle ones. As for Example, take two Numbers, 4 and 8, where one is as big again as the other. Hence the like proportion shall be between all Numbers doubly as big as each other: As between 5 and 10, 12 and 24, 24 and 48, 50 and 100, &c. And therefore the Logarithms of the Numbers, 4 and 10, 4 and 24, 4 and 48, 4 and 100, added together, will be equal to the Aggregate of the Logarithms, 8 and 5, 8 and 12, 8 and 24, 8 and 50, &c. The use of these Logarithms is very excellent, both for ease and saving of time for whatever can be done by the Golden Rule by a wearisome Calculation, and tedious Circum-

through

through Multiplication and Division, that a 4th Number unknown, may be found out from 3 known; this by Logarithms is performed at one single operation: For if 2 Numbers be to be multiplied, take their Logarithms, and you have your content only by Addition: If to be divided, you need only use Subtraction. For Example,

$$\begin{array}{rcl} 43 & \text{--- Log. ---} & 1,633468 \\ 25 & \text{--- Log. ---} & 1,397940 \\ \hline 1075 & \text{--- Log. ---} & 3,031408 \end{array}$$

Would you multiply 43 by 25; set down those Numbers, and against them set their respective Logarithms. So the Logarithm of 43 is 1,633468, of 25 is 1,397940, which added, make 3,031408. Which Logarithm being found in the Table, the absolute Number answering thereunto is 1075. And so much is the Product of 43 multiplied by 25.

There are Logarithms Pure and Impure, or Logarithms of Mixt Numbers and Fractions; of which you are amply informed in *Gunter*, or *Dr. Newton's Works*, &c.

Logistica, [Being of the same derivation with the last Word:] Is a part of Arithmetick, which applies the Rules of Computing, Multiplying, and Dividing to Degrees of Signs, Circles, and Angles; as also to Days and Hours, Minutes of Degrees or Hours, &c.

Longemetica, The measuring of Lengths, Heights, Distances, &c.

Log-line, A Line frequently used at Sea by all Sea-men; they often in Sailing Heave the *Log*,

the better to find out the Distance or Way the Ship runs, by help of this and their Minute-Glass, as all Authors plainly shew.

Longitude, [Lat. Length,] Is considered in a two-fold respect: Either by Astronomers, and then 'tis reckon'd in the *Ecliptick*, from the first Degree of *Aries* to the last of *Pisces*; and this by Circles passing by the Poles of the *Zodiack*, and each of its Degrees at opposite places. So that the Arch of the *Ecliptick* intercepted between the first Degree of *Aries*, and that Circle which passes through the Centre of any Star, shall be said to be the Longitude of that Star; and the more 'tis distant from the said point, the greater is its Longitude.

But **Longitude**, amongst Geographers, is, *An Arch of the Equator, comprehended between the first Meridian, and the Meridian of the Place you enquire after*; and shows how much one Place is more Eastern or Westernly than the other. For the greater a Places Longitude is, so much the more is it situate towards the East; and consequently the Sun Rises earlier, and comes to the Meridian sooner. Whence to compute the first or true Meridian, whether from the *Canaries*, or *Fortunate Islands*, according to *Ptolomy* and the Ancients; or the *Azores*, as most of the Moderns do, has been heretofore disputed; nor is it much material, if the World were but agreed upon it. We always in our Maps and Globes reckon it from the Isle *Gratiosa*, one of the *Azores*. By this the Greater or Lesser Distance of Places from each other may be found out, allowing for every Degree 60 Miles.

Lord of the Bear, Is that Planet that has most

Testi

Testimonies of Fortitude in a Revolutionary Figure.

Lord of the Geniture, Is that Planet that has greatest strength in the Figure of any Persons Nativity, called *Geniture*, from the Latin word *Gigno*, (to beget) and so becomes principal Significator of his Temperament, Manners, Affections of his Body, &c. But what Planet this shall be, is controverted: for *Julius Firmicus*, a celebrated Author, that flourished about 320 years after Christ, would have it to be the Lord of that Sign into which the Moon enters next after the Birth, except only the Luminaries, as being universal Significators. But we must note this Author to be a better Latinist than Astrologer; and the sounder opinion is, To constitute that Planet of the Five, Lord, that being in fit Places, shall have most Dignities in the places of the Luminaries, the Ascendant, the Mid-Heaven, and part of Fortune.

Lord of the Hour, Is a Planet governing each 12th. part of the Day, and also of the Night, severally and respectively, divided into 12 parts, which therefore we call *Unequal*. (as being varied according to the Length of the Day) or *Planetary Hours*, beginning at Sun-rising, and the first Hour attributed to that Planet which that day is assigned to, as on *Sunday* to ☉, on *Monday* to ☿, and so counting downwards, as the Planets are situate, and beginning again, till all the 12 Hours are past, and then going on with the next Planet for the Night; but reckoning a greater or lesser space for the Nocturnal Hours, as the Night happens to be longer or shorter than the Day. Some Authors ascribe a great deal of vertue to these Horary Rulers; but the Judicious *Morine* seems to slight the observation of them.

Lucter, [Lat. a Bringer of Light] *Venus* is called so, when she is Oriental, and Rises before the *Sun*; which the Greeks also term *Phosphorus*, and the Vulgar, *The Day-Star*: So when she sets after the *Sun*, she is called *Hesperus*, or the Evening-Star.

Luminaries, [Lat. Great Lights] The *Sun* and *Moon*, called so by way of Eminence, for their extraordinary Lustre, the one ruling the Day, the other the Night.

Luna, The Latin name for the *Moon*, the lowest or next to Earth of the seven Planets, Feminine, and Nocturnal: for that borrowing her Light from the *Sun*, she excels in passive Qualities and Moisture: And therefore as the *Sun* presides over the Heart, Spirits, and Blood, so the *Moon* over the Brain, Bowels, and Phlegm. She perfects her course in the Zodiack in the space of 27 days, 7 Hours, and 41 Minutes; but till she overtakes the *Sun* again, is required 29 Days, 12 Hours, and 44 Minutes. Hence arises a three-fold Month, of *Peragratiō*, or Periodical, wherein she finishes her Revolution. 2^{ly}. *Synodical*, the space of time between her parting from, and returning to the *Sun*. And 3^{ly}. The Month of *Illumination*, that is, the space that she is visible to be seen, which is about 26 Days and 12 Hours. There have not been wanting some, both Ancient and Modern Philosophers, that have conceited the Body of the *Moon* to be Inhabitable; but this seems repugnant to Divinity. *Qua supra nos nihil ad nos.*

M Machine



Machine, Is an Engine, or self-mover with Wheels and Springs, both in Clock-work, and for many other Uses, as well in *Mechanicks*, as *Mathematicks*.

Magazine, A Store-house for Arms or Provision, a word not much used amongst Mathematical Terms, and known to most People.

Magick, [From *Magos*, a Greek word, signifying an Interpreter of Divine Mysteries, properly the study of Natural Wisdom] A good and innocent Science, teaching the knowledge and mutual application of Actives to Passives, thereby performing many excellent and wonderful works. Such were the Three *Magi*, or Wise men that came out of the East to worship our *Saviour*. But afterwards the Study being depraved by the *Arabians*, and fill'd with many *Superstitions* *Vanities*, the word became to be taken in an ill sense, for *Conjuration*, or some such wicked Art, that by confederacy with, and the assistance of the Devil, does either truly do, or rather in a jugling deceitful way seem to perform some Miraculous Operations, or above the ordinary attainment of Humane Nature. In which *Pliny* represents *Zoroaster* as the first Grand Master.

Magnitude, [Lat. Greatness, or Bigness] Is the proper Subject of Geometry, at out which 'tis bu-
fied; as Speech is of Grammar, or Reasoning of
Logick.

Logick. 'Tis defined to be, *A Continued, or Continual Quantity.* As Number is said to be a *Discrete* (or Disjoyned) *Quantity*; for one, two, three, four, do consist of one, two, three or four Unities, which, are disjoyned and severed parts: whereas the parts of a Line, Surface, and Body, are contained and continued without distinction or separation.

Malefick, [Causing evil or mischief, a Latin word, from *Malus*, Evil, and *Facio*, to do] But is generally applied to *Saturn* or *Mars*, by reason of the ill effects attributed to them by Astrologers.

Mapp, [Lat. *Mappa*] a *Geographical*, and sometimes a *Chorographical*, Description of the Earth, or some particular parts of it, projected upon a plain Superficies, describing the form of Countries, Rivers, Situation of Cities, Hills, Woods, and other Remarks.

Mars, [sometimes called *Mavors*, both Latin names for him] The third (in order descending) of the Planets, being in nature Hot and Dry, but excelling in Driness, finishing his Revolution in the space of almost two years. He (as all the rest of the Planets, except the *Moon*) has the Sun for his Centre, so that when he is Achronically opposite to him, he seems to be below him, nearer the Earth, and appears almost as big as *Venus*, having a greater Parallax than the *Sun*, viz. four Minutes, as has oft been observed: Hence, when he is in the lowest Absis of his Orb, we find a great Intension of Heat, if it be Summer, or Remission of Cold in Winter: And the contrary, when he is in his *Apogaeon*, for the distance between them is said to be 1690280 miles, and therefore no wonder if it somewhat increase or abate his Effects on Earth,

as he is so much nearer to, or further from it. This Planet, by Astrologers, is called, The *Lesser Infortune*, an Enemy to Humane Nature, by reason of his scorching and over-drying Qualities. He signifies Military Men, Chyrurgions, Smiths, &c. and of Diseases, such as proceed from Adust Choler and heat of Blood, as acute Fevers, Yellow-Jaundice, Small Pox and the like.

Marine, Any thing appertaining to the Sea, and from thence *Mariner*, a Sailer or Master of a Ship, who ought to be skilled in the *Mathematicks*.

Masculine { **Planets** } This Term is used by
 { or } Astrologers, not to
 { **Signs.** } denote any real distinction of *Sex* in the Celestial Bodies, but only Analogically serves to signify the *Qualities* they are principally endued with: For if a Planet or Sign excel in Active Qualities, (that is, Heat, or Coldness) then 'tis said to be *Masculine*; but if its Passive Qualities (that is, Moisture, and Dryness) exceed, then 'tis called *Feminine*. Of Planets, *Venus* and the *Moon* are counted *Feminine*, all the rest *Masculine*, except *Mercury*, who is a kind of an *Hermaphrodite*: Of Signs, *Aries*, *Gemini*, *Leo*, *Libra*, *Sagittary*, and *Aquary*, are *Masculine*; the other six *Feminine*.

Passs, They are well known to appertain to all *Ships*, without which, there can be no Sailing.

Mazzaroth, A *Chaldean* word, signifying the *Zodiack*; 'tis used, *Job* 38. 32. *Canst thou bring forth Mazzaroth in his season?* but seems there to intend some Constellation.

Mathematicks, The word *Mathesis* being originally Greek, signifies *Learning* or *Discipline*.

And

And the Ancients concluding only those Sciences which are founded upon *Certainty*, and proceed by *Demonstration* worthy of that name, called them, *Mathematicks*. They contain in general *Geometry*, *Arithmetick*, *Astronomy*, and *Musick*; but indeed comprehend many other most excellent and useful Branches of Learning; as *Cosmography*, *Hydragraphy*, *Opticks*, *Astrology*, *Navigation*, *Architecture*, &c. Of the Necessity, Profit, Extent, Use, Dignity, and Excellency of all which, see *John Dee's* most profound and incomparable Preface to *Euclid's Elements*.

Matutine, [a Latin word, of, or belonging to the Morning] Astronomers call the other six Planets so, when being Oriental from the Sun, they are above the Earth when he Rises, and Vespertine when they Set after him. Now the three Superior Planets are strongest, being Oriental and Matutine; but the three Inferiour, when they are Occidental and Vespertine. The reason is, because the first in the first Case, but the last in the second, do then descend to the lowest part of their Orb, are increased in light, and approaching nearer the Earth; and so on the contrary, the Inferiors Matutine, the Superiors Vespertine, are weakned.

Mean Diameter. See *Oughtred's Gauging Rod*, fol. 5. &c. or any Book of Gauging: 'Tis a Geometrical Mean between the Diameters at Head and Bung in any close Cask.

Measure of Time, Is a matter much to be regarded in handling Nativities, that when you have a Direction, you may know how long it will be before it operates. For which purpose there are three opinions: First, *Ptolemy's*, to direct the Ascendant by Oblique Ascensions, the Mid-heaven

by Right Ascensions; and finding the Difference, allow for every Degree of the Equator one year. The second of *Maginus*, (induced thereto, as he confesses, by our late mentioned Dr. *Dee* of *London*) which is, For the common Measure of one Years space, in the Directions of every significator, to take that Ark of the Equator agreeing to the apparent motion of the Sun at the time of Birth, according to his Right Ascensions, and not Oblique Ascensions of the Region. The last, and now generally approved and practised, is that of *Valentine Naibod* in his Comment upon *Ptolemy*, which is, to find the distance between the Significator and Promittor, as in the first way, and then reckon for one of those degrees, one year five days and eight hours, and for every minute, six days and four hours; of which you have Tables in most *Genethliacal* Authors.

Mechanicks, [From *Mechanè*, a Greek word, signifying *Endeavour*, *Contrivance*, or *Invention*.] Are those Operations which are dispatch'd, as well by the labour of the Hands, as of the Brain. A Skill enabling a Workman without knowledge of Mathematical Demonstrations, perfectly to work, and finish any sensible work by the Mathematician Demonstrated, or Demonstrable. Furthermore, as their Arts, so such Workmen themselves are often called **Mechanicks**: A word ignorantly used by the Vulgar, in contempt, whereas there are scarce any Faculties more *necessary* to Humane Life.

Medium Cœli, Latin, In English, **The Mid-Heaven**, Is the tenth House or Angle of the South, in an Astrological Figure: In which, Planets and Stars have the greatest Altitude that they can have,

have, and consequently dart Rays more direct; and of greater Efficacy; it signifies Kings, Governours, Commanders, all sorts of Magistrates, a private man's Preferment, Profession, or Trade. *Jupiter* or the *Sun* found here, are very propitious; but *Saturn* or the *Dragons-Tail* in this House are said to deny such a Native Honour, and signify that he shall be but little esteemed in the World.

Mechanick Powers, or Mechanick Faculties, are Six. 1. *Libra*, the Ballance. 2. *Vestis*, the Leaver. 3. *Axis* in *Peritrochis*, the Wheel. 4. *Troclea*, the Pully. 5. *Cuneus*, the Wedge. 6. *Cochlea*, the Screw, unto some of which, the force of all Mechanical Inventions must necessarily be Reduced. See Bishop *Wilkins* his *Mathematical Magick*, *Archimedes*, or *Mechanical Powers*, Chap. 3.

Mercator's Cart, or **Projection**; A Projection of the Face of the Earth in *Plano*, wherein the Degrees upon the Meridian increase towards the Poles, in the same proportion that the Parallel Circles decrease towards the Poles: called *Mercators Cart*, or sometimes Projection, because *Mercator* was the first that published Carts so made; though our Country-man Mr. *Wright* was the first that made the Tables for this Projection. See *Wright's Correction of Errors*.

Mercury, The least of all the Planets, and lowest, except the *Moon*. Though some place him in the very Deferent of the *Sun*, and allow him not any proper Orb, but only an *Epicyle*, whereby sometimes he is placed above the *Sun*, and rendred invisible. 'Tis certain he is never above 28 degrees, or thereabouts, removed from the *Sun*, nor *Venus* above 48. And therefore neither of them both can ever make any Aspect with the *Sun*, but

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a Conjunction, which in truth is none. This Planet *Mercury* is of a dusky colour, but seldom seen, for the reason aforesaid; his mean motion is 59 minutes and 8 seconds; but sometimes so swift, that he goes a whole degree and 40 minutes in a day. His Nature is various, and participates much with the Planet he is with, or beheld by; yet in his own nature he is cold and dry, a great stirrer up of winds; and being strong, signifies a good Wit, or subtil, politick Brain, studious and docible; but when ill-dignified, an hair-brain'd, troublesome, prating fellow, a Liar, a Buffoon, &c. He generally denotes one of an high stature (but if Oriental more low,) an high fore-head, and somewhat narrow, long face, long nose, his eyes but small, and neither perfectly black, nor gray; thin lips and nose, little hair on the chin, but much on his head, of a sad brown, or inclining to blackness; long arms, fingers and hands, his whole Body slender, and little; nimble in his gate, and, quick in all his motions; his complexion palish, or like an Olive or Chesnut-colour: He signifies all Letter'd men, Philosophers, Mathematicians, Merchants, Secretaries, Advocates, Ambassadors, and sometimes, Thieves, Taylors, Carriers, Footmen, Solicitors, busie Secretaries, and they unlearned, but talkative; Conceited School-masters, &c.

Meridian, Is a Semi-Circle imagined in Heaven, that reaches from North to South, and passes through the *Zenith* of the place we inhabit in, into both the Poles: It cuts the Equator at Right angles; and its *Axis* is a Line passing by the Center of the Earth to the Heavens, and the ends thereof are called the Poles. 'Tis so called from the

Latia

Latin word *Meridies*, signifying Noon; because when the Sun, by the motion of the *Primum Mobile*, is brought to the Meridian of any place at all times of the year, it there makes Noon; and therefore by the help thereof, is found the Quantity of Day and Night; the *Semidiurnal* and *Seminocturnal* Arch of any Star, &c.

But you must know, that there are infinite Meridians in *Geography*; for all places lying East or West from one another, have different Meridians; so that a man moving directly North and South, keepeth the same Meridian; but going East or West, alters it. But the Meridians delineated upon the Terrestrial Globe, are in Number 36; So that between two Meridians is contained 10 degrees of the Equator: From the first of these Meridians, (which is divided into twice 90 degrees) accounted from the Equator towards either Pole, is the beginning of Longitude; which upon our English Globes, is at the Isle *Gratiosa*, one of the Isles of the *Azores*, and numbred in the Equator Eastwards, with 10, 20, 30, &c. to 360 round about the Globe, till it end where it began. See *Tutor to Astronomy*, pag. 8.

Meridional, Southern, or towards the South. From the Lat. *Meridies*, the Noon Point, which being always to us in the South, is likewise taken for it.

Meridian-Line; A Line of great use in *Navigation*, used in *Mercator's Sailing*; of which you may read the Use and Construction at large, in Mr. *Wright's Correction of Errors in Navigation*. Sold by *James Moxon*.

Metonick Year, [So called from one *Meton*, an *Athenian* that invented it;] Is the space of 1 year

years, (and thence for the most part called, *The Great Metonick Year.*) In which space of time the Lunations return, and happen as they were before *Mesolabum*, (as *Slucius* calls it, or as Master *Oughtred* calls it, *Mesolabium*,) Gr. from *Meson*, and *Lambano*, an Instrument for finding mean proportions.

Meteors, Gr. Are imperfect mixtures of the Elements drawn up by the Sun and Stars, and there hapning into several Forms. As sometimes were the matter is extraordinary, into *Comets*, blazing Stars, strange Appearances in the Air, *Ignes, fatui, &c.* but commonly into *Hail, Snow, and Hoary Frost*, which are soon resolved again into the form of their Elements.

Mid-Heaven. See *Medium Coeli*.

Mile. See the Postscript explaining and defining this and all other Measures used amongst us.

Milky-way, [Called in Greek *Galaxia*, in Latin *Via Lactea*, which are all of the same in sense, in the three several Languages.] Is the only real Circle in Heaven; for in a clear night 'tis always conspicuous like a Swadling band infolding the Constellations of *Cassiopea*, the Eagle, part of *Sagittary*, the Tail of *Scorpio*, the *Centaur*, the Ship *Argo*, the feet of *Gemini* and *Perscus*, &c. It appears with a kind of whiteness like *Milk*, but the cause thereof was much disputed, till our modern *Telescopes* convinc'd us, that 'tis only a heap of stars, which by reason of their smallness, and distance from the Earth, cannot be distinctly discern'd, and yet altogether make that part more bright than the rest of the Firmament. The Poets fable that 'twas made by *Ganimedes* spilling a large Bowl of Nectar, and that it was the Gallery

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through which the Gods went to Council with *Jupiter*. See *Ovid* 1. *Met. Est via sublimis, &c.*

Minute, In Latin *Minutum*, from *Minus*, less. Is the sixtieth part of a whole Degree, or Hour. So that every hour or degree of the Equator or Zodiack is divided into 60 Minutes, every Minute into 60 Seconds, each Second into 60 Thirds, and so to 10ths, or further, if you think you can carry your Conception so far.

Moon. See *Luna*.

Movable Feasts, Are those Festivals which though they are celebrated on the same day of the week, have no fix'd seat in the Calendar, but in several years happen on several days of the Month of which kind, besides *Easter* and *Whitsontide*, &c. are all the Lord's days in the year, whereof many being called by particular strange names in our Common Almanacks, I shall here take leave to explain them in order; Since, if all the Almanack makers themselves can well understand the reasons thereof, I am sure not one in a thousand of their Readers understand it.

To begin then with the year: If there be any Sunday between the Circumcision of our Lord, called *New-years-day*, and *Twelfth-day*, called *Epiphany*, [from the appearance of the Star to the Wise men,] such Sunday has no name assigned. The Sundays following *Epiphany*, are noted in order; as the 1st, the 2d, &c. after *Epiphany*; and they are sometimes more, and sometimes fewer. As *Easter* falls high, or low; for they must be added, and give place to *Septuagesima*, which is always the 10th Sunday inclusively before *Easter*, and thence is so called, as being *Seventy* days before it: So the next Sunday is called *Sexagesima*, and

the next after that *Quinquagesima*, called also *Dominica Bacchanaliorum*; (the Sunday of Revellers or Bacchanalians;) because then, and in the week following, many Christians shew themselves as mad as the Drunken Worshipers of *Bacchus* amongst the Heathen. 'Tis also called *Esto mihi*, because then the *Introitus* was out of *Psalms* 30. v. 3. beginning *Esto mihi*, The Wednesday in this week is *Dies Cinerum*, or *Ashwednesday*, being the beginning of Lent, on which they were wont to besprinkle their heads with *Ashes*. The next Sunday is *Quadragesima*, or the first Sunday in Lent, called also *Invocavit*, because then is sung that of the Psalmist, *Invocavit me, & ego exaudiam eum, He called upon me, and I will hear him*. The second Sunday in Lent is called *Reminiscere*, for the same reason, taken from *Psalms* the 25. v. 6. *Remember, O Lord, thy tender mercies, &c.* The third, *Oculi*, from the 15th ver. of the same *Psalms*, *Oculi mei semper ad Dominum, Mine eyes are ever towards the Lord*. The fourth, *Letare*, from that *Psalm* 66. 10. *Letare cum Jerusalem, Rejoyce thou with Jerusalem*. Some call it *Dominica de Rosa*, because then the Pope holds a Golden Rose in his hand at Church before all the People and others. The fifth, *Dominica de panibus*, because the miracle of the five Loaves in the Gospel is explained: This day with us is generally term'd *Mid-Lent Sunday*. The sixth Sunday in Lent is called *Indica*, from *Psalms* 43. ver. 1. *Judge me, O God, and plead my cause*. The next is *Palm Sunday*; so called from the Palm-branches which the people strew'd before our Saviour entering *Jerusalem*: 'Tis likewise called *Dominica Magna*, for the Great and ineffable Good wrought in the week following for the faithful;

for the Friday next is *Good-Friday*, as the day whereon our Blessed Saviour suffered for the sins of mankind. Then comes *Easter Sunday*, celebrated in memory of our Saviour's Resurrection, which is the Foundation and Rule for all the moveable Feasts. After this follows the *Quinquagesimal* or space of 50 days between *Easter* and *Whitsontide*. All which the Ancient Christians kept as a Festival, containing 6 Sundays: The first *Quasimodo Geniti*, from that of 1 Pet. 2. 2. *As newborn Babes, &c.* 'Tis also called *Dominica in Albis*, because those that were baptized at *Easter*, used to go in *White* Garments all the week, which this day at night they left off. The second Sunday is called *Misericordia*, from *Psalms* 32. 5. The third *Jubilate*, from *Psalms* 65. 1. The fourth, *Cantate*, from *Psalms* 97. 1. The fifth, *Vocem Jucunditatis*, from the *Introit* that day beginning so; 'tis also called *Rogation Sunday*, and the whole Week following, *Rogation week*, because then they made their Processions into the Fields, said the Litany, and made their Prayers and Requests [*Rogationes*] to God publickly. The Thursday in this week is *Holy Thursday*, kept in memory of our Saviour's Ascension into Heaven. The last is called *Exauda*, from that of *Psalms* 27. *Hear, O Lord, my voice*. Then succeeds the Grand Feast, called by us *Whitsontide*, (because people appeared in such colour'd Garments anciently;) but in Greek *Pentecost*. Which, as it was observed by the Jews in memory of the promulgation of the Law at *Mount Sinai*, just 50 days after their *Passover*, so Christians observe it the seventh Sunday after *Easter*, (called still *Pascha*;) by reason that then the Holy Ghost was sent, and the Gift of Tongues conferr'd upon

the Apostles. The next is *Trinity Sunday*, and from thence the Sundays are reckon'd in order; as first, second, third, &c. after *Trinity*, to the first Sunday in *Advent*. Which time of *Advent* or *Coming*] being a kind of Preparation for the Grand Festival of our Lord's Birth, contains the four Sundays next before *Christmas*; and are reckon'd by number, as first, second, &c. Sunday in *Advent*. And thus much of Moveable Feasts, which may seem a Digression, but not to be condemn'd by them that perhaps had never heard so much, if they had not met it here.

Moveable Signs, Are the same that are named *Cardinal*, viz. *Aries*, *Cancer*, *Libra*, and *Capricorn*; so called, because they are Arguments of the Motions of Times; as from which, the mutations of the Seasons are made in Spring, Summer, Autumn, and Winter; one passing to the other according to the Predominancy of the four first Qualities; so *Aries* and *Libra* bring in the Spring and Autumn, *Cancer* and *Capricorn* Summer and Winter, each of them excelling in suitable Qualities. And as these Signs are the beginning of Mutation in *Celestials*, so in these *Inferiors* they cause Mutability, and are tokens of Mutations, as on the contrary, Fixed Signs are of Stability.

Multipler, Manifold, from *Multus*, many, and *plico*, to fold.

Multangled Figure, or a Figure of many Sides and Angles.

Multilateral, [Many Sided.] All Figures that have more than four Right Lines, are so called by *Euclid El. 1*. From the Latin, *Multus*, many, and *latus*, a Side.

Multiplication, Is a common Rule in *Arithmetic*,

rick, serving instead of a manifold Addition, In it there are two Numbers given, one to be multiplied (which is the greater) called the *Multiplacand*; the other that by which it is to be multiplied, called the *Multiplicator*; and a third Number to be found, called the *Product*, which as often shall contain the first Number, as there are Units in the second.

Musick, Gr. Is one of the seven Liberal Sciences, and a fourth Branch in the general Division of the Mathematicks, having for its Object *Discreet Quantity* or *Number*, but considers it not absolutely like Arithmetick, but with proportion of *Time* and *Sound*, and in order to making a delightful *Harmony*; so that indeed Musick is nothing else but the Agreement, apt proportion and Mixture of *Acute*, *Grave*, and *Mixt* Sounds.

Mute [or Dumb] Signs, are those which are denominated from Creatures that have no voice as *Cancer*, *Scorpio*, and *Pisces*; and in Nativities when the Significators are therein, do spoyl, or cause some Impediment in the Native's Speech.

Mutilated, [Lat. *Lame*, or *Deficient* :] Otherwise called *Azimene Degrees*; are certain degrees in several Signs: As from the 6th, to the 10th, of *Taurus*; from the 9th, to the 15th of *Cancer*; the 18 7 and 28 of *Leo*; the 18 and 19 of *Scorpio*; the 1. 7. 8. 18 and 19 of *Sagittary*; the 26. 27 28 and 29 of *Capricorn*; and the 18 and 19 of *Aquary*, that threaten the Native that has them Ascending, or the Moon Lord of the Ascendant or of the Figure, in them, with lameness, deafness, halting, or some inseparable defect in some eminent Member. And amongst the Fixed Stars, *Cerberus* and *Medusa*, if mixed with the Significators by Direction

rection or otherwise, is said generally to threaten Beheading, or loss of Limbs.

N

Nadir, Is an *Arabick* word, and signifies that Point of Heaven under the Earth, which is Diametrically opposite to the Point directly over our Head, which in the same Language is called the *Zenith*; so that they both are as it were Poles of the Horizon, and distant from it on each Side 90 degrees, and consequently fall upon the Meridian, one above, the other under the Earth; and look what distance one of them has from the Equator, and one of the Poles of the World; the same on the contrary has the other to the opposite Pole, and adverse part of the Equator.

Papers Bones.	} These are Instruments,
Nautical Compass.	
Nautical Card.	

the first for Multiplication, Division and Extraction of Roots with much ease, the other for Navigation, and frequently sold at most Instrument-makers Shops.

Natural	{ Day, and Year,	{ The space of 24 hours, or Revolution of the <i>Primum Mobile</i> ; one Revolution of the Sun by his proper motion, or 365 days and almost 6 hours.

Nativity, In an Astrological sense, is the true time of any person's Birth, *viz.* when he first begins to breath in the World, and thereby in a pe-

culiar manner becomes liable to the Celestial Influences; but is appropriated rather to the Scheme or Figure of the Heavens, carefully Erected for that moment of time. The word is from the Latin, *Nascor*, to be born, or rather its participle, *Natus sum*.

Navigation, Is an Art that demonstrateth how by the best way, aptest direction, and shortest time, a sufficient Ship, between any two places (in passage Navigable, assigned) may be conducted, and in all storms and disturbances hapning, how to use the best possible means to recover the place first Assigned.

Rebulous [Cloudy] Stars, Are certain Fixed Stars of a dull, pale, and obscurish Light. So called either because they look Cloudily, or rather because they generate Clouds; and setting with the Sun, render the Air troubled, and duskish: As also they are found by Experience, being joynd with the *Luminaries* to afflict a Native with blindness or dimness. There are also in every Sign certain degrees called **Dark**, and others **Smoky**, which have the like effect in altering the Complexions, and impairing or obscuring their Understandings; whose principal Significators happen to be posited therein. Of which, and several other Divisions of the Signs, see a necessary Table, in that useful *Enchiridion* for all Artists; Entituled, *A Tutor to Astrology* p. 64.

Needle. See *Box and Needle*.

Neomentum, A Greek word used by some Authors; that signifies only the *New Moon*, or Change.

New Moon. See *Nobilunium*.

Nocturnal, [From the Lat. *Nox*, the Night,

Of or belonging to the Night. Signs or Planets are said to be so, in which Passive Qualities, as Moisture and Driness, excel. See *Diurnal*. Also the name of an Instrument used for the observation of the Stars, &c.

Nodes, [A Latin word signifying properly Knots, twistings or twinings one over another; but] by Astronomers used to signify the Intersections of the Orbit [tract or course] of the Sun, commonly called the Ecliptick; and the Orbits of the other Planets that have Latitude: So that the Point where a Planet passes over the Ecliptick out of Southern Latitude into Northern, is called its North *Node*. And where it descends from North to South, its South-*Node*, which change their places in the *Zodiack* like the Planets, but contrary to the succession of the Signs; yet those of the three Superior Planets move insensibly; those of the three Inferiors faster; but those of the Moon are only or chiefly taken notice of, commonly called the *Dragons-Head* and *Tail*, Which see before.

Nonagesimus Gradus, or the 90th Degree; of use in the Computation of Eclipses and other matters in *Astronomy*.

Nona Sphæra, [Lat. the Ninth Sphere;] Is usually termed *Primum Mobile*, it is the First Mover, being above the 8th Sphere or Starry Heaven, and carrying with it all the Inferior Sphere with a most swift motion from East to West, finishing its Revolution in 24 hours.

Novilunium, From the Lat. *Novus*, New; and *Luna*, the Moon. The Latin word for all that time before and after the Moons Conjunction with the Sun, (or Change) wherein she is not visible.

But

But to find the exact moment of the Conjunction, some Authors prescribe a pleasant sensible Experiment, viz. Take a Glass or Silver Vessel, fill'd with Lye or fair Water, into which some time before, put the Ashes of an Olive-tree or Vine, which will rest quiet in the bottom; but as soon as the Moon enters the Diameter of the Sun, will rise, trouble the Water, and be hurried round, not resting till she is perfectly past the Body of the Sun. This my Author affirms he hath often tried.

Rones. See before in *Calends*.

Roꝛthern Signs, The first six Signs are called so, because they decline from the Equinoctial Northward.

Number, Is commonly defined to be, *A Collection of Units, or Multitude composed of Units*; so that *One* cannot be properly termed a *Number*, but the beginning of *Number*: Yet I confess this (though generally received) to some seems questionable, for against it thus one might argue: A part is of the same matter of which is its Whole; An Unit is part of a multitude of Units; Therefore an Unit is of the same matter with a multitude of Units: But the matter and substance of Units is Number; Therefore the matter of an Unit is Number. Or thus, A Number being given, If from the same we subtract 0, (no number) the Number given doth remain: Let 3 be the Number given, and from the same be taken 1, or an Unit, (which, as these will say, is no number) then the Number given doth remain, that is to say, 3, which to say, is absurd. But this by the by, and with submission to better Judgments.

Dr. Wallis in his *Arithmetick*, says, That a Point in *Geometry* is equal to (0) in *Arithmetick*

for a Point is *Indivisible*, and so is a Null or Cypher: And farther, that Unity is the least Number, viz. (1,) A Null is Number, a Null (or Cypher) is the beginning of Number in the same sense as a point is of Magnitude (or Line, &c.) in which sense Unity is deny'd to be Number, *Euclid B. 7. Def. 1. 2.*

Numeration, [*Lat. Numbring*] the first of the five Vulgar Rules of Arithmetick, teaching to read truly any Sum or Number, or write it down aptly when 'tis propos'd.

Numerator, Is the upper Figure in a Fraction; so called, because it Numbers how many parts are to be taken out of those into which the Whole is divided: And the under Figure is called *Denominator*, because it shews how the parts taken are to be denominated, whether Seconds, Thirds, &c. As $\frac{1}{4}$ One Fourth part, One is Numerator, Four Denominator.

There are many other Terms in the *Mathematics* appertaining to *Number*, as *Square Numbers*, *Cubick Numbers*, &c. Also *Surd*, *Deaf*, *Irrational* or *Incommensurable Numbers*, &c. Also *Rational* and *Commensurable*, *Geometrical*, *Harmonical*, *Polygonal*, and *Pyramidal*, and divers others, Explained in their proper places, and therefore needs no more words in this place.



Obeying Signs. The Southern, or last six Signs of the Zodiack are so called.

Oblique, Crooked, bending, or winding towards one side. The word *Oblique* signifying crooked, warpt, or bending.

Oblique Ascension. See *Ascension*.

Oblique Sphere. See *Sphere*.

Oblique Angle. See *Angle*.

Oblique Signs. See *Signs*.

Oblong, A long Square, or Figure in *Geometry*, of four Sides, and Rectangled, but not Equilateral, or not having all the Sides equal to one another, though its opposite Sides be.

Obtuse, Blunt, or Broad.

Obtuse Angle. See *Angle*.

Occidens, & *Occidens* is Latin for the *West*, and because the Sun or Stars do occi-

Occidental Sdere, fall down, or Set there.

'Tis properly therefore that part of the Horizon where the Equator, or a Star therein, descends into the lower Hemisphere. But 'tis improperly, yet frequently taken for all that Arch of the Horizon, which defines the Occidual Amplitude of the Stars. Hence in Astronomy, the 7th. House from the Horoscope is called, *The Angle of the West*. In Geography, the West was anciently reckon'd from the *Fortunate Islands*, but now is generally counted from the *Azores*.

Occultas

Occlusion, A Term in *Astronomy*, shewing a Star or *Planet* is hid from our Sight, &c.

Occidental, A Planet is said to be *Occidental*, when it sets after the Sun; but

Oriental, *Oriental*, when it rises in the morning before him. See *Matutine*.

Octahedron, [From *Octo* Eight and *Hedron* a Side] Is a Solid Figure, contained under eight Triangles, Equal and Equilateral. *Encl. Elem* 11.

Olympiads, The space of four years, whereby the Ancient *Greeks* reckoned their Memorable Occurrences; they took their Original from those famous Games celebrated every 5th. year in *Elis*, and came into use about 500 years after the destruction of *Troy*: And in the year of the World 3248. Before the Institution of these *Olympiads*, the *Greeks* History is generally fabulous.

Opposition, [From the Lat. *Oppono* to oppose, thwart, or contradict] Is, when two Planets, being distant 180 Degrees behold one another diametrically opposite; and therefore is Counted an Aspect of the greatest *Enmity*. Yet between the Benevolents (especially of the same nature) it becomes good as some Artists are of opinion.

Opticks, [So called from a Greek word signifying *Seeing*, and from the Lat. *Perspectivæ*] An Art Mathematical which demonstrates the manner and properties of all Radiations, Direct, Broken, and Reflected. See a Book entitled, *Practical Perspective*.

Orb, [A Latin word signifying properly any round thing, and so 'tis often taken for the World, but in an Astronomical sense] It is taken for the Deferent of each Planet, which is vulgarly called its *Sphere*: Yet in truth, an Orb differs from a *Sphere*.

Sphere; for *this* properly signifies a Globe, contained under *one onely* Superficies; and solid even to the Centre; but an *Orb* is a Spherical Body limited with *two Superficies*, one outward, which is *Convex*, (or bulging forth) the other inward, which is a *Concave*, (or hollow, vaulted over like an Oven.) And therefore look how many Heavens, so many Orbs there are, the Higher encompassing the Lower; and how much the Concave Superficies of the uppermost is, so much also is the Convex of the Nethermost, much like the several Peels and Coats of an Onion. But because every Orb or Heaven contains within it self likewise other Orbs; as for Example, the Orb of the Sun contains three other several Orbs, of which, two are Excentrick after a certain sort, and the third simply so: Therefore for avoiding confusion of words use has obtain'd, that now the Heavens themselves should not be called *Orbs*, but *Spheres*; and thus the greatest Sphere is the *Primum Mobile*; next the Sphere of the Fixed Stars, after that of *Saturn*, then of *Jupiter*, &c. to that of the *Moon*, the lowest and least of all, as well in Circuit as thickness, the compass of her Concave being 758250 miles; the thickness, that is, the space contained between her Concave and Convex 109056 miles; the compass of her Convex, which is the same with the Concave of *Mercury*, as aforesaid 1443750 miles.

The thickness of *Mercuries* Orb 370480; the compass of his Convex Superficies 3772500 miles.

The thickness of the Orb of *Venus* 3413756; the Circuit of her Convex 25230375 miles.

The thickness of the Deferent of the *Sun*

339102;

339102; the compass of its outward *Convex* Superficies 27361875 miles.

The thickness of the Orb of *Mars* 27339375; the compass of its *Convex* 199209375 miles.

The thickness of the Orb of *Jupiter* is extended unto 19775497; the compass of its *Convex* 323512500 miles.

The thickness of the Orb of *Saturn* is 29474574; the compass of his *Convex*, and consequently of the *Concave Superficies* of the Firmament or Heaven, in which the Fixed Stars are placed, 508781250 miles.

The compass of that Firmament 80241471; and the compass of its *Convex* 1017562500 miles, which last sum is the circuit of the *Concave* of the *Primum Mobile*; but its thickness, or the measure of its *Convex*, is by no means to be found out: yet rationally by comparison we may judge it so vast, that even the Starry Orb may not be much more comparable to it, than our Earthly Globe to the Firmament. Well then, from this Immense Fabrick may we with the Psalmist cry out, *The Heavens declare the glory of God*, and shew forth the Workmanship of an Almighty and Adorable Architect. They that would be satisfied further on this Subject, let them read *Clavius* on the Sphere of *Sacroboscus*, cap. 1. and rather most of our Later and most Refined Astronomers, that have within this last half Century of Years, very much improv'd Astronomy by Observations.

Orbit, [Lat.] is properly the Tract left by a Wheel in the Road; hence Astronomers use the word to signify the way or course of the Sun, (peculiarly called the *Ecliptick*) as also of any other Planet moving on according to the Circle

of

of its Latitude; nor is this without reason, for the transient Planet leaves behind him I know not what impression or footsteps of his Virtue and Quality, as Snails and other Insects leave marks of their tabifick quality in the path they pass over.

Ordinate Figure, &c. See *Ramus*, 37. 39.

Oriens, [from the Lat. *Orior*, to arise] The East point properly where the Sun Rises, when he is in the Equinoctial points *Aries* and *Libra*, but serves for all that part of the Horizontal Circle in which the Sun, at any time in the year rises to us. Hence comes the word **Oriental**, of or belonging to the East, or pertaining to Rising. See *De cideus*.

Oriental, Opposite to *Occidental*: A Planet is said to be *Oriental* of the Sun, when he Rises before him, and *Occidental*, when he Rises after him, as you may see in all Books of the Introductory part of *Astrology*.

Orthogon, [from the Greek *Orthos* Right, and *Gonia* an Angle] A Right Angle, or a Geometrical Figure, which consists of Right Angles, and has an Equality of all its parts.

Orthographie, [from *Orthos*, True or Right, and *Grapho*, to write; so that] The true *English* of this word being of *Greek* descent, is true or right Writing, and so 'tis used by Grammarians. But in the Mathematicks, and particularly in Architecture, 'tis taken for the Model, Platform, and Description of the front and Bigness of a House that one is going to build, contrived according to the Rules of Geometry; according to which Idea or Pattern, the whole Fabrick is erected and finished. 'Tis a Term also frequent in Perspective; and therein

herein, the Orthography of any Body, or Building, is the fore-right side of any Plain, that is, the side or Plain that lies parallel to a straight Line, that may be imagined to pass through the outward convex points of your two Eyes, continued to a convenient length: So that the Office of Orthography is, to delineate the fore-right Plain.

Oval Figure, [From the Lat. *Ovum* an Egg] Geometricians call that so which resembles an Egg, round, but Oblong, so that Lines drawn from its farthest Superficies to the Centre, are not equal, and yet answer well enough to each other from the opposite sides: It differs from an *Ellipsis*, because that is plain and circumscribed by one only Line, whereas this is solid, included every where with Superficies, as a Globe is; only the Globe is exactly round which this is not.

Otacoustacon, An Ear-pipe, to augment Hearing.

Orygon, or **Orygonium**, [from the Greek *Orys*, acute, or sharp, and *Gonia*, an Angle] is a Geometrical Triangular Figure, having necessarily all its three Angles acute; in which it differs from an *Embygon*, that must have but two acute, and the third obtuse. Therefore every *Oxygonal Triangle* may be either Equilateral, which necessarily will not be a Right Angle, and consist of three Acute angles; or an *Isoceles*, viz. if it have two equal sides, and those greater than the Third; or a *Scalenum*, which hath all its Sides unequal. Whereas an *Embygon* can only be an *Isoceles*, or a *Scalenum*, but not Equilateral; since a Figure which has altogether equal Sides, can in no wise terminate in an Obtuse Angle.

P

Panfullne, A Greek word used by some Authors for the Full Moon; from *Pan*, All, or the Whole, and *Selene*, the Moon.

Parabola, (or according to some, **Parabol** [a Greek word signifying a Plant] is a Figure in Geometry, or Area, circumscribed by two Lines one Right, and the other Crooked; The Right Line being an *Axis* for the Crooked to move about upon, of which, the great *Archimedes* wrote much and first of all, with many Arguments and Demonstrations attempted to Square it, and that not without success. See this Figure in most Books of Solid Geometry.

Parallax, A Greek word, signifying a Change or Variation, but used in Astronomy for the Deviation or Error of the Sight, occasion'd by the distance of the Term of the visual Line, projected from the Superficies of the Earth to a Star or other *Phenomenon* in Heaven, from the Term of another Line projected from the Centre of the Earth to the Body of the same Star; in the place where he truly is: For when we behold the Star from the Earths Superficies, which is almost 3000 miles from its Centre, it must needs follow, that the place designed, by a Right Line from the Centre of the Earth, would be different from what we now make, so that the Star would seem to be quite otherwise situate. This variation or divergence

ity of Aspect is called the *Parallax*, which is
 greater or lesser, according to the greater or lesser
 nearness that the Star has to the Earth. Besides,
 it has place, in a Ray obliquely cast, or when a
 Star, not being Vertical, projects its Beams, as it
 were, on one side, and so to the Centre and Su-
 perficies of the Earth: For when 'tis Vertical,
 casting its Beams directly to the Superficies, it
 must needs pass by the Centre which is just under,
 and so suffer no Parallax: Therefore the further
 they are from the Zenith, and nearer the Hori-
 zon, so much the greater is their Parallax; which
 on the contrary is proportionably decreased, as
 they more and more approach the Vertix. See
 the Demonstration hereof in all Books of *Astro-*
nomy, as *Wing*, *Street*, and all our late English
 Writers; easy enough to be had, and which I pre-
 sume, few Students but have them in their Studies.
 Comets and new Appearances in the Airy Re-
 gion suffer the greatest Parallax, next the *Moon*,
 and other Planets, to whom the Earth carries
 some sensible proportionate bulk: but higher, as
 in the Sphere of the Fixed Stars, to which the
 whole Earth is but as a Point, there is no Parallax;
 nor is it sensible in *Saturn*, or *Jupiter*; but *Mars*,
 in Perigeeon, has a Parallax of 4 Minutes; in Apo-
 geon, scarce any at all; *Sol* generally 3 Minutes,
Venus and *Mercury* very little; but the *Moon*,
 when near the Horizon, almost a whole Degree;
 and always appears lower than indeed she is. By
 help of this Parallax, we know the distance of the
 Planets between themselves, and from the Earth,
 the time of their true Conjunction, and especially
 come to distinguish the true moment of Eclipses
 from the apparent.

a **Parallels**, A Greek word, signifying things that are equal to each other mutually, when compared together; and so are **Circles** and **Lines** equidistant from each other, which though infinitely extended, can never touch. But more usually the word is taken for **Circles** of a like distance from the **Equator**; and this as well considered on the **Superficies** of the **Earth**, as in the **Heavens**; for those that are in the same distance from the **Equator** towards the same **Pole**, are said to be in the same **Parallel**. Now as there are infinite **Meridians**, so there are infinite **Parallels**; and as the **Meridian Lines** on the **Globe** are drawn only through every 10th Degree of the **Equator**, so are the **Parallels** but to each 10th. Deg. of the **Meridian**. These **Parallel Circles** run **East** and **West** about the **Globe**, even as the **Equator**; only the **Equator** is a great **Circle**, and these are every one less than other, diminishing gradually till they end in the **Pole**.

Parallel Sphere, hath one **Pole** of the **World** in the **Zenith**, the other in the **Nadir**, and the **Equinoctial line** in the **Horizon**; so called, because the **Sun**, **Moon**, or **Star**, in a **Diurnal Revolution** of the **Heavens**, neither ascend higher, nor descend lower, but always move parallel to the **Horizon**. The **Earth** is thus posited under the **Poles**, and there a whole year makes, as it were one day, viz. six months **Light**, and six **Darkness**. See **Sphere**.

Parallelogram Is **Quadrilateral** (or four-sided) **Figure**, whose two opposite **Sides** are parallel, or equidistant; from the word *Parallel* and *Gramma*, a **Letter** or **Figure**. It is also the name of an **Instrument**, whereby two **Copies** of a thing may be writ or drawn at once.

Para

Paralleloplena, Are imperfect Parallelograms, and Irregular Correspondencies of the Angles or Sides whereby they are constituted; for they are a sort of Trapeziums, as having unequal Angles or Sides, but not all so; for they keep at least somewhere a certain regularity and proportion of Parallels, whence they do not extend so largely as Trapeziums, which include every kind of Figure in any manner Irregular, yet like them they may be Multiplied and Diversified almost Infinitely. Whereof see *Clavius on Euclid*.

Parallelopipedon, Greek, Is a solid Figure consisting of 6 plane and equal Sides, of which every one is equal, and Parallel to that which is opposite to it. So that every *Parallelopipedon* may be called a *Prism*, but not every *Prism* a *Parallelopipedon*, as by the Definition of a *Prism* will appear. See *Prism*.

Parelia, [Mock Suns] are Reflections of the solar Beams in hollow watrish Clouds, which like Glasses they receive, and so lively represent his image, that their appears as it were another Sun, and make it difficult to a vulgar Eye to distinguish which is the real, and which the fictitious one; or sometimes the Reflection is single, only on one side, sometimes double on either side, and the true sun in the midst. Their natural signification is to denote approaching Rain.

Paraselene, [A Mock-Moon] the same kind of Resemblance of the Moon, as *Parelia* is of the sun, and occasion'd by the same means, but not so frequently; both words are part Latin part Greek, the first from *Par* (equal or like to) and *Elios* or *Sol* (the Sun) The second from the same Latin

word *Par*, and the Greek word *Selene* signifying the *Moon*.

Part of Fortune, Is said to be the Lunar Horoscope, or place in the Situation of the World from whence the *Moon* takes her progress at that moment that the *Sun* Emerges from the Line of the East; And therefore if you take it upon a New *Moon*, 'twill fall in the Ascendant, If upon a Full *Moon*, in the 7th House, &c. The usual way of taking or finding it is thus:

1. Take the Sign, Degree, and Minute of the *Moons* place,
2. The Sign, Degree, and Minute of the *Sun* place; Subtract the Latter from the Former adding 12 Signs to the *Moons* place, if it cannot be done otherwise;

What remains add to the Sign and Degree of the Ascendant, and if both make above 12 Signs, cast away 12, and what Signs, Degrees, and Minutes remain, (Reckoning here as in the whole Work from the beginning of *Aries*) Let your part of Fortune be there. 'Tis called part of Fortune, because

most Astrologers do regard it in Judgments of Natives Fortune, Estate or Riches: And according as 'tis well or ill affected, pronounce concerning the same; Its Character is thus ☉; but being only an Imaginary Point can cast no Ray of Aspect. There are likewise other parts, as *Part of Life*, *Part of Death*, *Part of the Wife*, &c. invented by the *Arabians*, but being generally exploded as vain, I omit them.

Partile Aspect, Is not as some may fancy by the sound of the word partly or almost an Aspect, but an Aspect in *Part*; But the most exact and full

Aspect

Aspect that may be so called, because it consists precisely of so many parts or degrees as are requisite to Compleat such an Aspect even to a Degree; As *Mars* in 24 Degrees of *Aries*, and *Venus* in just the 24th of *Libra*, this is a Partile Opposition; The *Sun* in one Degree of *Taurus*, and the *Moon* in one Degree of *Cancer* make a Partile Sextile; And it is a more strong Sign or Argument in Judgments for performance of the thing, or that the matter is near hand Concluded, when the Aspect is so Partile, and signifies Good, than when 'tis Platick, but it's as much a Sign of present Evil when Mischief is threatned, whereas the Platick Aspect shews something past or to come, rather than now present or suddenly imminent. See Platick.

Part Proportional, A part or number agreeable and Analogous to some other part or Number; Or Medium to find out some part or Number unknown by proportion and equality of Reason. See Quantity, and enough of this in every Book of Arithmetick, and Books of the Mathematicks, e. g. If 60 give 40, 30 must needs give 20 by the Golden Rule, or part proportional.

Pentagon, [Gr. from *Pente* five, and *Gonia* an Angle] Is a Geometrical Figure having 5 Angles, whether they be Equilateral (of equal sides) or not; If it be Equilateral, it is called a regular *Iso-perimeter*, which in the Heavens makes that New Aspect called a *Quintile*, but if it have unequal sides, then it is called absolutely Irregular, and may like *Trapezia's* many ways be varied.

Pentangle, The same, only a Greek and Latin word joyned, having five Angles.

Perch, See the Appendix of Measures.

Peregrine, [A Latin word that properly signifies a stranger, one out of his own Country where he has no Home, nor Authority] It is a Term attributed by Astrologers to a Planet that is found in a place of Heaven, where he has none of his five Essential Dignities, viz. *House*, *Exaltation*, *Triplcity*, *Term*, or *Face*; So *Saturn* in the 10th of *Aries* is *Peregrine*, but in the 27th Degree cannot be said to be so, because there he is in his own *Terms*: Or if there be a mutual Reception of two Planets by *House* or *Exaltation*, as the *Sun* in *Virgo*, *Mercury* in *Leo*, then neither of them shall be said to be *Peregrine*; In other Cases where a Planet is so, it is Counted an Essential weakning, and the like being in his Detriment reckon'd five Debilities.

Perigeon. See *Apogeon*.

Perihelion, [Gr. from *Peri* about, and *Helios* the *Sun*,] That point of a Planets Orb wherein he is nearest to the *Sun*.

Perimeter, A Greek word, the same with *Circumferentia* in Latin, or that which incloses any Figure, as the *Perimeter* of a Triangle is a Line made of 3 Lines; of a Circle, a Periphery, of a Cube a Surface compounded of six Surfaces, of a Sphere, or whole Spherical Surface, &c.

Periæci, [Gr. from *Peri* about and *Oik* Habitations] The *Periæci* of any place is in the same Latitude, but is distant in the Longitude 180 Degrees, viz. half the Circumference of the Earth in that Parallel. Thus the *Periæci* of *England* is about 20 Degrees to the Eastwards of *Carbaio*. In the *Periæci* of any place there happens not that Contrariety of Seasons in the year, that doth in the *Antipodes*, nor in the Length of Days; for the Day

Days in both Places are of equal Length, but in the Times of the Day there is the same Contrariety: for though there Spring be our Spring, and the rest of the seasons of the year the same with ours; yet their Morning is our Evening, and their Night is our Day. See *Antoeci*.

Periphery, A Greek word signifying That Circular Line which goes about and infolds the whole Area or Content of a Circular Figure: The proportion of which to its Diameter is as 22 to Seven: the word is likewise sometimes taken for the whole Superficies of the Earth, or for the Convex and outermost part of any Celestial Sphere.

Periscis, [from the Greek *Peri*, about, and *scia*, a shadow] People that live within the compass of the *Artick* and *Antartick* Circles; so called, because the shadow is various, and runs round about them.

Perpendiculum, ? [From the Latin, *Perpendo*, and

Perpendicular, *S*to hang down] A Perpendicular, or Plumb-line, is an Instrument well known to Mathematicians, and most Mechanicks, used for the finding out whether any Pillar, Wall, &c. stand upright. Hence Geometricians call that a Perpendicular, which is let fall from above into a certain Bottom, with the same streightness as the Plumbet hangs in a Perpendiculum. Astronomers also are wont to say, those Stars that are Vertical (or right over our heads) are Perpendicular, because their Beams fall so upon us. A. B. in the Figure 3. is a Perpendicular.

Perspective, [from the Latin *Perspicio*, to look at, or through] A Faculty, which according to Geometrical Precepts, by the visual Rays, Speculates

culates and Measures, all visible Bodies and Colours, &c. and is three-fold; One strictly called *Perspective*, which renders a reason of those Appearances, which offer themselves to our sight otherwise than the things really are, by reason of their different situation and distance. The second is conversant about several Refractions, which it for the most part considers in or from *Looking-Glasses*, 'tis thence called *Ars Specularia*. The third is employ'd about *Shadows*, and shows how those things that in Painting appear confused and disorderly, by the diversity of site or placing, may appear agreeable, and in order; and so on the contrary: And this is called *Sciastoptrica*. Of all which, see *Kercher's* elaborate Treatise, entitled, *Arsmagna Lucis & Umbra*. See also *Practical Perspective*.

Phases, A Greek word, signifying Appearances, or the manner of things showing themselves; and therefore used for the several postures in which the Planets (especially the *Moon*) offer themselves to our sight, as obscure, horned, half illuminated, or full of light; which by the Telescope may likewise be observed in *Venus* and *Mars*.

Phænomena, [from the Greek *Phainomi*, to shew or appear] Appearances or strange Sights; often used for Comets, or new Stars, whether in the Elementary or Ætherial Region.

Phœnon, *Saturn* is sometimes called so, from his Nature, the word signifying *bloody, sad, and cruel*.

Phosphorus, The Usber or Harbinger of Day; *Venus* is so called in Greek, when she is our Morning Star. Also a Substance Chimically prepared, that shines and gives light in the dark.

Pilas

Pilasters, A Term in Architecture, signifying Square Pillars, that usually stand behind Columns to bear Arches, &c.

Pisces, [Lat. the Fishes] The twelfth and last Sign of the Zodiack in the Southern Semicircle, but bordering on *Aries*, and therefore common, waterish, cold, and moist. The House of *Jupiter*, and Exaltation of *Venus*.

Planets, The word is originally Greek, and signifies as much as *Wanderers*; whence we call them Erratick Stars, viz. Stars not placed in the Firmament, as the Fixed, but in Orbs of their own, and by their proper motions wandring in the Zodiack, contrary to the motion of the *Primum Mobile*, from West to East, according to the succession of the Signs. They are in number Seven, (not to speak of those lately discovered about *Jupiter* and *Saturn*) viz. *Saturn*, *Jupiter*, *Mars*, *Sol*, *Venus*, *Mercury*, and the *Moon*. These all differ from the rest of the Stars, not only in Motion, as aforesaid, but also in Light, being to be known from the other, in that they never Twinkle which the Fixed always do.

Planisphere, [From *Planus*, Plain, and *Sphæra*, a Sphere] A Sphere described in *Plano*, or a plain or flat Projection of the Sphere; viz. all the Lines and Circles thereof: And thus the Maps either of Heaven or Earth are called Planispheres: And so are all other Astrolabical Instruments.

Plain, Amongst Geometricians, is a flat Superficies; that is, a Superficies that lies equal between its Lines, whereby 'tis opposed to a Spherical Body, and a Circle, which are circumscribed with a crooked Line, or Superficies. Hence that vulgar Axiom, *That a Spherical Body touches not a Plain but in one Point.*

Plane

Planetary Hour. See *Lord of the Hour*.

Plain Chart, A Plat or Chart that Sea-men Sail by, whose Degrees of Longitude and Latitude are made of the same length. Thus in

Plain Sailing, Sea-men by their Account of Sailing East, West, North, South, or any other Point of the Compass, and of the Distance the Ship has run upon the Plain Chart.

Plain Scale, A thin Ruler of about a Foot in length, whereon is graduated the Line of Chords, Leagues, Rumbs, &c. By which little Instrument Sea-men are much help'd to keep an Account of the way the Ship has made.

Planimetry, The Art of Measuring Plains and Superficies.

Platick Aspect, Is a Term to distinguish it from *Partile*. *Plains* in Greek signifies *wide*, or *broad*; so this Aspect takes more room than the other which is confined to the same Degree, whereas this is a Ray cast, not exactly from one Planet to the Body of another Planet, but only within the Orb of his Light. To know when this Aspect happens, you must know the quantity of this Planets Orb; and add them together, and take one half thereof, and if your Planets be within so many Degrees of a Partile Aspect, then they are in Platick Aspect one with another; the quantity allowed to each Planet for its Orb, before or after any Aspect, is as follows.

	d	m		d	m
Saturn	10	00	Sol	17	00
Jupiter	12	00	Venus	08	00
Mars	07	30	Mercury	07	00
			d	m	
The Moon	12	30			

Now

Now suppose *Venus* in the 10th. Degree of *Taurus*, and *Saturn* in 18 Degrees of *Virgo*; here she is in Platick Trine with him, because she is within the moiety of both their Orbs; for the moiety of *Saturns* Rays or Orb is 5 deg. and of *Venus* 4. and the distance between them and their perfect Aspect is but 8 deg.

Thus also the Fixed Stars have an Orb of Activity on either side, those of the first Magnitude 7 Deg. 30 min. of the second Magnitude 5 deg. 30 min. of the Third 3 deg. 40 min. of the Fourth 1 deg. 30 min. And note, that this Platick Aspect is cast either on this side, or beyond the Body of the Planet; the first is called *Application*, for in that case, the Planet aspecting applies and disposes himself to have familiarity, and come to a Partile Aspect with the other. The second is named *Separation*, for then it has been in Partile Aspect, and now by motion is parting away, but yet not got out of the bounds of its Orbs; which is chiefly regarded in the *Moon*: and the nearer this is to a Partile Aspect, so much the more efficacious it is; and better generally is an Application, than the Separation or *Deflux*. See *Partile Aspect*.

Punch, A Term in *Architecture*, appertaining to one of the 5 Orders. See *Vignolia*.

Plumb-Line. See *Perpendicularum*.

A Point, [in Latin *Punctum*.] Is the smallest part of Quantity, or that Extreame which can be divided into no further parts. The same (in a manner) in Quantity, as a *Unit* in Number, an *Instant* in Time, or a *Sound* in Musick. To apprehend its Nature and Use, let us imagine an exceeding small *Thick*; Prick, or point made on a Paper

a Paper with the nib of a Pen, which if again it shall be drawn out further, it will make a *Line*, having Length indeed, but not Breadth or Depth, and terminated at the two Ends with Points. Next, let us suppose the same Character indivisible, and produced longwise or broadwise, two or more parallel Lines touching each other side by side, will make a *Superficies*; and then, if at last it be produced as well to be deep and broad, which it will be, if several Superficies be conceived one upon another, then have we a *Solid Body*, capable of all dimension. And thus are exhibited all the three kinds of Quantity, according to the three-fold Dimension, about which all the labour and speculations of Geometry are employ'd.

Poles, [from *πολεις*, a Greek word, that signifies to run about] are properly the two Extremities of an Axis about which any thing movable is turn'd: And because in the Heavens there is such a regular and never ceasing Circular Motion, and many Moveables, of which, each goes by its proper Orbit, therefore the Poles are very much to be minded in our Considerations of the Heavens, and as many Orbits as there are, so many double Poles are to be conceived. Thus the Poles of the *Horizon* are the *Zenith* and *Nadir*; the Poles of the *Meridian*, the two Points of the Rising and Setting of the Equator in the Horizon; the Poles of the *Equinoctial Colure*, are the two Solstitial Points *Cancer* and *Capricorn*; the Poles of the *Solstitial Colure*, the two Equinoctial Points *Aries* and *Libra*; the Poles of the *Equator*, and Circles thereunto Parallel, are the two Poles of the World; and lastly, of the *Zodiack* and *Ecliptick*, the Poles of the Zodiack, which describe two
 lesser

leffer Circles, *Artick* and *Antartick*, distant 23 Degrees and a half from the Poles of the World. Yet the Word *Poles* absolutely taken, and without addition, is usually meant the Poles of the World, because only they continue immovable, and all the Spheres hurried by the motion of the *Primum Mobile*, are once in 24 hours wheel'd round about them. Or, 2^{ly}. the Poles of the Zodiack, about which are turn'd all the second Movables, as the Starry Heaven, or Orbs of the Planets, from West to East, in appointed Periods.

But since these Poles are only Points conceived in the Heavens, therefore that the Artick Pole of the World may be known, we must imagine a Right Line from the Pole-Star to another next it in the Tail of the Little Bear; on which Line, make an Equilateral Triangle towards the Head of the Great Bear, at the top of which Triangle is the *true place* of the Pole. But this labour will be saved in the next Age, for then the Pole Star, that has 88 Deg. Declination, will have 90, and so fall directly on the Pole.

Pole or Perch, A Measure. See the *Appendix*.

Polar Circles, The Artick and Antartick are so called. See *Arctos*.

Polar Draught, A Representation of the Earth, or of the Heavens, projected upon the Poles of the Equator. In Polar Draughts, all the Meridian-Lines are Equi-distant from each other in every Parallel, but the Circles representing the Parallels are not Equi-distant from one another.

Poles of a Dial. All Dials, though upright, or Inclining, or Reclining, are yet Horizontal Dials, in some part of the Earth, and the Zenith and Nadir

Nadir of that Horizon are the Poles of that Dial. But how to find where these Poles will fall, see *Tut to Astron. & Greg. Book 5. prob. 14.*

Polyedron,	} A Geometri-	} Plain Faces,				
Polygon,			} cal Figure con	} Angles,		
and					} sisting of ma-	} Lines.
Polygram,						

Edron being Greek for a Basis, Face, or Side; *Gonia* for, an Angle, and *Gramma* for a Line.

Wonderous, [Lat. heavy or slow] Those Planets are said to be so that move leisurely and slowly, like a man under a burden; as *Saturn*, *Jupiter*, and *Mars*, who never by their Diurnal Motion can reach one whole Degree.

Position, A putting, placing, or representing of things; as the respect of a Planet, in an Astrological Figure, to other Planets and parts of the Figure, is called his *Position*.

Postventional, Coming, or that is to come after. They are words seldom used but in reference to the Lunations, (Change or Full of the Moon) next before or after any great Conjunction of the Superiors, Appearance of a Comet, Revolution of the World, or other Figure, from consideration of which foregoing or following Luration, the Artist is assisted in his Judgment.

Preventional, [from the Latin *Preventio*] Coming, or that hath come, Before.

Primary Planets, Are the 3 Superior Planets, *J*, *S*, and *M*.

The Prime of the Moon, An old word for signifying the New Moon at her first appearing, or about three days after the Change, at which time she is said to be Primed.

Prime Figure, Is that which cannot be divided, into

into any other Figures more simple than it self: as a Triangle in Plains, the Piramis in Solids; for all Plains are made of the first, all Bodies or Solids compounded of the Second.

Prime, or First Number, Is defined by *Euclid* to be that which only Unity doth measure, as 2, 3, 5, 7, 11, 13, 17, 19, 33, 29, 31, &c. for only Unity can measure these.

Powers, Numerical, Geometrical, Mathematical, and otherwise called Integer, Mixt, Quadratick, Biquadratick, &c. Cube, &c. See (in part) *Rathborn*, fol. 15.

Primum Mobile, [Lat. the First Mover] Is the tenth Sphere, which includes the Firmament, or Heaven of Fixed Stars, and all the Spheres of the Planets, and hurries them round from East to West once in 24 hours, on the Poles of the World. And this Heaven is known only by its Motion, for there be in it no Stars, no Images, nor Characters, (as some have vainly and superstitiously fancied) for even the Signs and Circles which we imagine to be therein, are only fictitious: Yea, some of the Learned amongst whom is the Noble *Tycho* himself) are of opinion, that there is no such distinct Sphere, *Primum Mobile*, (or without Stars) and only serving for Motion: For they conceive probably, that the Diurnal Conversion of the World, is not caused by any such separate *Primum Mobile*, but from the nature of the whole Celestial Region; that the whole *Æther* is moved on the Poles of the World by its proper vertue, conferred it by God, from East to West; in which, the mean time, all the Stars and Planets are carried, by their proper Motions, from West to East,

East, on the Poles of the Zodiack; which are therefore called *Secunda Mobilia*, to distinguish them from the other.

Prisme, [In Greek *Prisma* signifies a sawing or cutting, but used in Geometry for] A Solid Figure, contained of Plains, two of which (those that are opposite to one another) are equal alike, and parallel; but the others are Parallelograms.

Problem, Gr. It is opposed to Theorem, and such a Proposition as is referred to Practice: is a Proposition, which requireth some action or doing, as the making of some Figure or to divide a Figure or Line, to apply Figure to Figure to add Figures together, or to substract one from another, &c. As the first Proposition of Euclid's first Book is a Problem, viz. *Upon a given terminated Right-Line, to make an Equilateral Triangle* which, after the Demonstrations is concluded after this manner, *Therefore, &c. which was to be done.*

Profiles, Is a Term in Fortification. See *Orthography*: 'Tis also called *Section*, 'tis an Italian word, and is that Design which shews the Side with the Rising or Falling of any Work, as a place drawn Side-ways, that is so, as only one Side or Moiety of the Bulwark may be seen: Or 'tis a Perpendicular or Upright Draught of any Fortification, as it doth Represent it self to the View being Finished, shewing the Breadths, Heights, Depths, and Lengths of the Rampart Parallel Ditch or Covert way. See the late Book of Fortification, published by Mr. R. Morden, for a Terms in that Art.

Professions, [from *Proficiscor*, to pass, or go forwards] are equal and regular Progressions

the *Sun*, and other Significators, through the Signs of the Zodiack, according to the Successions of the Signs, allowing to each Profection the whole Circle, and one Sign over: As if the *Sun*, in the first year, be in 24 Degrees of *Aries*, next year he shall be in 24 Degrees of *Taurus*. Besides these Annual Profections, there are others Monthly and Annual. But being devices not much regarded by Modern Artists, I shall not here trouble the Reader further about them.

Prohibition, [Lat. a forbidding or hindrance] Is, when two Planets, that signifie the effecting, or bringing to conclusion any thing demanded, or applying to an Aspect, and before they can come to a true Aspect, another Planet interposeth either his Body or Aspect, so that thereby the matter is hindered and retarded.

Projection of the Sphere, Is a describing the Lines and Circles of the Sphere, or so many of them as the purpose requires, upon a flat surface. Thus Maps, Astrolabes, Sun-Dials, Quadrants, &c. are all Projections of the Sphere.

Promissors, or Promissors, [Lat. from *Pro-mitto*, to promise or engage, to bring somewhat to pass] A Term used in the Genethliacal part of Astrology, treating of Directions; so called, because they promise in the Radix something to be accomplish'd, when the time of the Direction is fulfilled; and are only the Planets, or their Aspects, or in some cases Fixed Stars, to whom their Significators, that is, the Horoscope, Mid-Heaven, *Sun*, *Moon*, and *Part of Fortune*, are directed.

Proper Motion, Is the motion of a particular Planet from West to East, in Contradistinction of

its enforced Diurnal Motion from East to West caused by the *Primum Mobile*.

Proportion, [called in Greek *Analogy*, and sometimes after the Latines, *Proportionalitas*] Is a *similitude or likeness of two, or more Reasons between themselves*. This is the Basis on which the whole Structure of Geometry is founded, and the scope to which all its Precepts tend. But because the Quantity is two-fold, Continu'd and Disjoyn'd hence arises a *Two-fold Proportion*, *Geometrical*, and *Arithmetical*; the first is regarded in *Continued Quantity*, the second in *Numbers*, comparing one with another, and thereby coming to the knowledge of others before unknown; yet both are performed by Numbers, and retaining each his own name, extends it self to consider the other Quantity, according to the divers reason of Proportions, and habitude of one thing to another applying afterwards to Continued Quantity what was made out by *Quantity Discreet*: And on the contrary, feigning in Numbers all the Passions of Continued Quantity, that what in one is conspicuous, may be made appear so in the other, by the same reason of Habitude. Thus in *Quantity Discreet*, 'tis as easy as in *Continued*, to assign Whole and Parts, Indivisible Points, which are Units, composing the same Discreet Quantity into Numbers, Plain, Solid, Square, and all other sorts of Figures. The *Arithmetical Proportion* therefore is, when three or more Numbers proceed with the same difference, as 4, 7, 10, 13, 16, &c. each Number exceeding that which goes before by the Number Three. But the *Geometrical Proportion* is, when three or more Numbers have the same Reason, as 2, 6, 18, 54, &c.

162, &c. where every Number bears the same Proportion to that which precedes, or *Triple Reason*, containing three times as much.

Of Proportions, whether in Continued or Discreet Quantities, some are *Rational*, others *Irrational*: The Rational is that which two *Commensurable Quantities* have between themselves: The Irrational that which two *Incommensurables* have. Now those Quantities are said to be *Commensurable*, which have one *Aliquot part*, or which one common Measure can mete; as are Lines of 20 and of 8 Inches, whereof the Aliquot part is a Line of 4 or 2 Inches. But Incommensurable Quantities have no Aliquot parts; that is, there is no common Measure given that may measure them; as is the Diameter of a Square, and the Side of the same Square: For though each of those Lines have infinite Aliquot parts, as the Half, the Third, &c. yet 'tis not an Aliquot part common to both, that is, not any Aliquot part of the one, be it never so little, can possibly measure the other. There are divers other Considerables about Proportions, for which, see *Euclid, Elem. 5*.

Proposition, [From the Lat. *Propono*, to propound, or shew forth] Amongst Geometricians is a Sentence set forth to be proved by Reasoning and Demonstrations, and therefore is again repeated in the end of the Demonstration.

Prozogator of Life, The same with *Hylech*, which see.

Prostapherisis, [A Greek word, signifying as much as filling up, or Adequation] Is that part of the Ecliptick which is to be added or subtracted from the *Mean Motion* of the Planets to ob-

tain the True, or from their *True* to obtain their Mean Motion.

Pseudostella, [Greek, a false Star] Any kind of Comet or Phænomenon newly appearing in the Heavens like a Star.

Pyramid, [so called from the Greek word *Pyr*, signifying Fire, because a flame ends Taper in a Point like this Figure] so a solid Figure contained under diverse Plains, which meet or Terminate, at one and the same point being drawn from another Plain which is for the Base of the Pyramid, and here note that every Body whether Opacous or Luminous transmits its shadow or Light after a Pyramidal Form. Only the Luminous Body casts it so, that the Vertex (Top) of the Pyramid form'd is in that point of the Luminous Body from whence the Light proceeds, and the Basis on the Superficies of the Body inlightned, but an Opacous Body casts its shadow contrarywise, the Basis of the pyramid by it made, being in the Superficies of the body making the shadow, and the *Vertex* in a point of any body to which the shadow is extended.

Pyraïs, [Greek Fiery] A Greek name for *Mars*, from his fiery Nature, colour and brightness so called.

Q Quadrant,

Q

Quadrant, [from the Lat. Quatuor, Four] Is the 4th part of a whole Circle, or 90 Degrees, and from thence the Name of an Instrument, which amongst all Mathematical ones may justly Claim the Pre-eminence, for by its help almost all the operations of Geometry, Astronomy, and other Mathematical Sciences are both affected, and easily apprehended; but especially the Elevation of the Pole, and height of the Sun or other Stars above the Horizon; Their Declination, Distance from each other, Place in the Zodiack, &c.

Quadrant of Altitude, Is the part of the Furniture of an Artificial Globe, being a thin Brass Plate divided into 90 Degrees, and marked upwards with 10, 20, &c. being Rivetted to a Brass Nut which is fitted to the Meridian, and hath a screw in it, to screw upon any Degree of the Meridian; when it is used it is most commonly screwed to the Zenith. Its use is for Measuring the Altitudes, finding Amplitudes, and Azimuths, and describing Almicantrahs. See *Tutor to Astronomy*, pag. 6.

Quadrat. See Square.

Quadrangle, A Geometrical Figure consisting of four Angles, as a Parallelogram, Rhombus, Rhomboides, &c.

Quadrature of the Circle, See *Squaring of the Circle*.

Quadrilateral, having 4 Sides.

Quadrupedial, [From the Lat. *Quatuor* 4, and *Pes* a Foot, four-footed] Signs, See *Bestial*.

Quadruple, Fourfold.

Quarters of Heaven, The four Principal, East, West, North, and South; but in Astronomy they are Intersections of the Sphere considered as well in the World as in the Zodiack, of which two are Oriental and counted Masculine, reckoned from the Rising of the *Sun* to his place at high Noon, and from the West to the *Imum Celi* in the World, and from the beginning of *Aries* to the beginning of *Cancer*, and from the beginning of *Libra* to the end of *Sagittary*, and the other two just the contrary.

Quantity, Is the proper and largest object of Geometrical Arts, not as 'tis an accident adhering to matter, and endued with sensible qualities; (For so the consideration of it belongs to Philosophers) but as it is an Extension of parts, and a certain apt measure both to measure other quantities, and be measured again by them. See *Point*.

Quantity discreet, &c. See *Proportion*.

Querent, [From the Lat. *Quaro* to seek] An Enquirer, the person that demands a Question of an Astrologer generally signified by the Ascendant its Lord, and Planets therein, and the *Moon*. Hence

Querited, The party or thing Enquired after, or concerning, whose Significator is varied according to his Relation to the Question, or nature of the business belonging to such or such an House; As if a Question be askt about a Brother, the third House and its Lord shall signifie him; if a Child, the 5th, &c.

Quina

Quinque-Angled, That has 5 Angles, from the Lat. *Quinque*, Five.

Quintuple, Five-fold.

Quintile, One of the New Aspects invented by *Kepler*, thus marked, Q. It happens when Planets are distant a 5th part of the Zodiack or 72 Degrees, and in its Nature is good and favourable.

Quincunx, Another of those New Aspects, when Planets are distant 5 Signs or 150 Degrees.

Quotient, A term in Arithmetick derived from the Latin word *Quoties*, how often, because it shows how often a small Number in Division is contained in a greater, as 4 is the Quotient of Twenty divided by 5.

R

Radius, Lat. properly a Ray or beam of the Sun, but in the Opticks 'tis defined to be a Luminous straight Line, or an *Illumination made by a right Line*, and yet that is but one sort of them, for there are two others; A *Reflex Ray*, which is transmitted from the body illuminated either back to the Luminous body, or sideways on some other Object; and a *Refracted Ray*, which is when the Medium is too thick, and so it glances into a thinner, or too thin, and so it chooses one more thick, as when from the Air 'tis diffused upon the Water. In Astronomy, a *Radius* or a Ray is taken for the Aspect or Configuration of two Stars: so we say

Saturn

Saturn beholds *Venus* with an *Hostile Ray*, &c. when she is square with him; but amongst Geometricians by Radius is meant, the greatest *Sine*, which is the *Semidiameter* of a Circle, and the half *Chords* subtended under the whole Circle, after which follow other lesser Circles always less and less even to the Complement of the Arch under which they are subtended; by which (by the help of the Rule of Proportions) we find out the Quantity of the other *Sines*, and the Arch by which each is subtended, as also of the Tangent and Secant: In Scheme 1. AB is Radius to that Circle. See further Radix.

Radix, [In Lat. a Root] by similitude taken from the root of a Tree; from whence all the body and Branches proceed: It is used by Artists for beginning of things, or the foundation whence is drawn the reason of Computing the Celestial Motions, relating to such a person or thing, so the Nativity or Figure erected for the time of any persons birth, is called *The Radix* in respect of *Revolutions*, *Directions*, *Progressions*, &c.

Rational, A Rational Figure or Number, *Body*-. Geom. (Ram. 38.)

Ravilin or **Half-Moon**, A Term used much in Fortification now in our Age, especially by the *French*.

Rational way of Erecting a Figure, Is a way of Distributing the spaces of the Houses; Invented first by *Abraham Avenezra*, and since highly asserted by *Rigiomontanus*, who for the Excellency of it in his apprehension called it the *Rational way*, as esteeming the method prescribed by *Ptolemy* and others of the Ancients absurd and fantastick, Now the Division they propose, is to divide

divide the Equator (as *Ptolomy* and his followers did the Zodiack) into twelve equal parts by 6 great Circles drawn through mutual Sections of the Horizon and Meridian, &c. Being the way now commonly Practised by all Astrologers in erecting their Figures.

Rampart, A Bulwark, 'tis a Term common in Fortification, and demonstrated by all Authors of that Subject. See a late piece thereof, published by Mr. *Mordant*: Or that of Sir *Jonas Moor*, &c.

Reason, This word is used by Mathematicians in a peculiar Sence, and is thus Defined by *Euclid* *El. 5. Reason is an Habit of two Magnitudes of the same kind compared the one to the other, according to Quantity*: whereby it appears, that when two Quantities of the same kind, as two Numbers, two Lines, two Superficies, two Solids, &c. are Compared to one another according to Quantity; that is to say, according as one is greater or less than the other, or equal thereto, such Comparison is called *Reason*, or (as others will have it) *Proportion*; *Reason* and *Rational* in this Sence is variously divided, as *Reason*, *Rational*, and *Irrational*, *Reason of equality and inequality*, *Reason Multiplex*, *Reason Multiplex Superparticular*, &c. For all which see *Euclid* in the 5th. *El.* aforesaid, where they are all explained: and no pretender to Mathematicks being to be supposed to be without that most Necessary Author, I think it not necessary here to transcribe them.

Reception, [Lat. a Receiving or Entertaining from *Receptio*] Is a kind of accidental Dignity or Fortitude happening to two Planets (especially if they are agreeable in nature, and friendly) when they are found in each others Houses, Exaltation, or

or other essential *Dignities*, as ☉ in ♋ and ☿ in ♏. Or ☉ in ♏ and ♀ in ♋. The first is a Reception by House, (which is the best and strongest) The second is a Reception by Triplicity, if the Question or Nativity be by day.

Reflexion, Lat. Is a Redoubling of the Action or quality sent from some Agent upon the Patient, whereby the same Action or quality produced in the Patient, is intended, and Acted over, endeavouring to tend back again to the first Agent. So Light darted from the *Sun* upon a Looking-glass is intended (or made more strong) and turn'd back encreased through the same Medium that it came; 'Tis to this Reflection of the Solar Beams that Heaven owes those thousands of Beauties which every clear night we admire; for the Stars are supposed to have no Light of their own, but what they receive this way from the *Sun*.

Refraction, [Lat. a breaking back or again] The word is used in Astronomy and Perspective, to signify that diversity of Aspect, and Error of the Sight which happens in our contemplating the Stars, or beholding any other bodies at a great distance, either by Optick Instruments, or any interposed Diaphonous body, when thereby the Rays or Species of the Visible object are broken, and represent the things otherwise than in truth they are; as is manifest in Looking-glasses, which according to their greater Density or rarity notably alter the Object; the general Cause of Refractions are the obliquity of the Sight, and the thickness of the Air, which the thicker it is the greater will be the Refraction, hence Stars near the Horizon are most obnoxious to it, whereas in the Meridian the Air is more clear and free from vapours,

vapours, so that there they suffer little or no Refraction; the knowledge hereof is of good use in Eclipses to find out the *true* time of Incidence, Greatness and Duration from the *Apparent*.

Regiment, or Rule, or Government, A Regiment of Soldiers is the Proper Command of a *Colonel*; If it be of Horse, it commonly consists of 5, 6, 7, or 8 Troops: If it be Foot, it usually hath 8, 9, 10, 11, or 12 Companies.

Region. Our Hemisphere, or the four Cardinal points of the Heavens, or of the Air, or either, &c.

Refragation, [from the Latine Particle *Re* and *Frangum* a Bridle, a holding back as with a Bridle] 'Tis a kind of weakning to a Planet, which is called so by Astrologers when a Planet going to an Aspect with another, before they come up to it becomes *Retrograde*, and thereby is as it were pluckt back, as *Saturn* in 12 Degrees of γ , *Mars* in 7 Degrees, here δ hastens to a Conjunction of *Saturn*, but before he comes to the 10th or 11th Degree of γ , he becomes *Retrograde*, and by that means refrains to come to a δ of η , who still moves forward in the Sign. Nothing signified by the former Conjunction will be Effected.

To Rectify a Nativity, Is to bring the Estimate and supposed time to the true and real time of a persons Birth. For which there are several ways, as the *Animodar* of Ptolomy, the *Trutine* of *Hermes*, and by *Accidents*, which last as the most certain is generally followed.

Reclining, [Latine, to lean backwards] A Term used in Dyaling for a Plane, that leans from you when you stand before it. See *Mechanick Dyalling*.

Rectangle

Rectangle, A Right Angle. See Angle.

Regular Figures, Are such as are Equilateral, and of equal Angles, as are all *Isoperimeters*, and yet these words not Synonymous, *Isoperimetral* Figures are understood to be those which contain equal Circuits; But Regular Figures are those where the Angles and Lines or Superficies are equal: On the contrary, those called Irregular, which have not the Equality of Sides and Angles, as are *Prisms* and *Trapezia's*; and to know these, Describe a Line about any Figure from its Centre as its Angles, if the Circumference equally touch all the Angles, the Figure is Regular, otherwise Irregular.

Residual Figure, The Remaining Figure after Subtraction of a less from a greater.

Requisites, As in particular, in the Art of Dialling. See *Wells* or *Gunter's* Dialling.

Reprise, A Term in Navigation, also in Musick.

Retrograde, [Lat. moving or going backwards] A Planet is said to be so by Astronomers, when by his proper Motion in the Zodiack he moves contrary to the successions of the Signs; as if he go from the second degree of *Aries* to the first, and so into the 30th degree of *Pisces*, which is by all accounted the greatest Debility that can happen to a Planet, as to be swift in Motion is a very great Fortitude; the reason whereof seems to be this, that when a Planet is swift, he strives more against the Motion of the *Primum Mobile*, and staying longer above the Earth has more time to diffuse his Light and Influence on Inferiors, whereas he that is Retrograde is so far from resisting, that he Anticipates the Motion of the *Primum Mobile*.

Mobile, and finishes his Revolution in less than 24 hours, so has not time to affect inferiors so powerfully with his Qualities, and consequently must be accounted *weak*; and this (by the way) may be one reason why the Planets have more power over us than the Fixed Stars.

To Retrogradation all Planets, except the *Luminaries*, are subject; not that really they move backward, but because they are carried every one in his Epicycle, which has the *Sun* for his Centre: and so whilst the Orbs are carried about with the rapid motion under the *Primum Mobile*, their Bodies, in respect of us, seem sometimes to move backwards, sometimes to stand still, and sometimes move swifter and slower, though in truth the always go on equally and in the same manner in their Epicycle. But when they are in their first station, descending from their *Apogæon* to their *Perigæon*, they appear Retrograde, as you may sensibly behold in a Sphere.

Retrenchment, A Term in Fortification, and 'tis understood both in General and Particular.

Retrocession, A Retracting or going back.

Revolution, [Lat. a turning round, or rolling about] Is the Circulation of any Sphere or Star, till it return to the same point in which it was when first it began to move. Thus *Saturn* finishes his Revolution in the Zodiack in the space of almost thirty years, *Jupiter* in twelve, *Mars* in two, the *Sun* in one year, the *Moon* in one month, and the *Primum Mobile* in the space of one natural day, that is, 24 hours. But sometimes, especially among Astrologers, the word is more strictly taken for the return of the *Sun* precisely to the same point of the Zodiack that he was in at the begin-

beginning of a thing. Thus the Figure of his entering *Aries* is called the *Revolution of the World*. So in the Doctrine of *Nativities*, a *Revolution* is the annual return of the *Sun* to that very point wherein he was at the *Radix*, or time of Birth. And the Figures erected at these moments of time, are called *Revolutional Figures*.

Rhabdology, [from the Greek *Roabdos*, a Rod] A way of counting and measuring by Rods; called, *Napiers Bones*.

Rhombus, Is a Geometrical Figure, having four Sides, and those equal, but the Angles unequal, two opposite ones being Acute, the other two Obtuse. So called from the Greek word *Rhombos*, which signifies the Fish called the *Turbot*, and the Quarrells of Glass in a Window.

Rhomboides, Is of the same derivation, being just of such a shape or form, a Figure of four Sides, having not only its Angles, but Sides too unequal; yet so, that two as well Sides as Angles opposite to each other are equal: And is a Figure between a *Rhombus* and a *Parallelogram*; from the one it takes proportion of Angles, from the other correspondence of Sides: And therefore for its likeness to a *Rhombus*, is called *Rhomboides*.

Rhumbs, Are neither Circles, nor Streight Lines, but *Helispherical* or *Spiral Lines*; but in Plain Cards, and *Mercator's Cards*, they are represented by Streight Lines: They proceed from the point where we stand, and wind about the Globe of the Earth, till they come to the Pole, where at last they lose themselves. They represent the Thirty two Winds of the Mariners Compass. Their use to shew the Bearing of any two Places one from another; that is to say, upon
what.

what Point of the Compass any Shore or Land lies from another. They are first called *Rhumbs* by the *Portugals*, and that name since continued by all Authors (as well Latin as others) that have occasion to speak of them.

Right Angle. See *Angle*.

Right { **Ascension.** } See *Ascension*.
 { **Descension.** }

Right Ascension of Time. See *Lilly* 490. or it is 15 Degrees of the *Æquator* that passes through the Meridian every Hour of Time, as may be seen by the Globe, and 'tis usually put in the first great Column of all Tables of Houses for setting of Celestial Schemes, answering to every Degree of the Sun's place in the *Ecliptick* upon the *Mid-heaven*, or *Tenth House*. See Tables thereof in *Louis Astrologia*, pag. 382, 383, &c.

Right Line, Is that which is equally distended between its points; that is, hath nothing of turning or bending any away, and consequently of all Lines is in its Nature the shortest.

Right Sphere. See *Sphere*.

Right Line, See *Sine*.

Roman Indiction, see *Indiction*.

Rod, } See the *Appendix* of Measures.

Rood,

Rule of Three, A Rule in Arithmetick, so called, because by the help of Three Numbers given, finds out a Fourth unknown; and for the Excellency of its use is stiled, *The Golden Rule*: the way is, to multiply the Third Number by the second, and dividing by the First, the Quotient shall be the Fourth Number sought. As if the

L

Question

Question were thus: If a Pillar of 6 Foot high cast a Shadow of 10 Foot, how high must the Tower be that casts a Shadow of 125 Foot? Set your Numbers thus, still observing to set Numbers of the same Nature over against another.

$$\begin{array}{ccc} (1) & & (2) \\ 10 & \text{Z} & 6 \\ (3) & 125 & 75 (4) \end{array}$$

And having wrought it, you will find the Quotient to be 75 Foot, which is the height of the Tower enquired after, viz. Set is thus, 10 : 6 :: 125 : 75. And here you may observe, that so often as 10 is to be had in 125, viz. $12\frac{1}{2}$, so is 6 in 75, viz. $12\frac{1}{2}$ also.

Ruminant Signs, [from the Latine, *Ruminant*] Signs chewing the Cud] Are those Signs of the Zodiack represented by Creatures that use the Quality, viz. *Aries*, *Taurus*, and *Capricorn*. And it seems the *Moon*, in any of them, causes Effects somewhat like that of Beasts, holding their Meats in their Throat, and chewing it over again. For Physicians caution us by no means to take Physic then, because 'twill lie long in the Stomach, and be apt to be cast up again by Vomit ; and therefore Vomits do best then.

Rythmos, A Greek word, signifying Number or rather the Harmony and Proportion of Numbers. Whence come the Words *Arithmetick*, *Logarithms*, *Rithm*, which we commonly write *Rhythm* &c. It also signifies Metre, Rythm, or Verse, as the *Psalms of David* are usually put into Metre, &c.

S

Sagittarius, [Lat. the Archer, or Bowman, from *Sagitta*, an *Arrow*, in Greek 'tis called also *Chiron*, and *Philyrides*] is the 9th. in order of the 12 Signs of the Zodiack, the House of *Jupiter*, and Triplicity of him and the *Sun*, The Ancients would have the *Dragons-head* to be exalted in it; but many modern Artists do not agree thereunto. 'Tis a fiery common Sign; in the first *Mediety*, (or half) *Humane*; in the rest, *Ferine*, wild, or bestial.) The reason of the name of this Sign must be drawn from the Poetical Fable of *Chiron*, the Son of *Saturn*, who was a Centaur, (that is, half a Man and half a Horse) Whence the Herb *Centauria* is so called, he being the first that found it out, for he had great skill both in Herbs and Astronomy; insomuch that at last (as the Story goes) he was translated into Heaven, and turn'd into this Constellation.

Sattellites, [a Latin word, signifying properly Gentlemen of the Guard, or Soldiers attending a Prince for the safety of his Person] Is taken by Astronomers for those Planets who are continually waiting upon, and roll'd round about another Planet; as *Venus* and *Mercury* may be called the *Sattellites* of the *Sun*. But the word is chiefly used for those new discovered small Planets, or little Erratick Stars, which make their Revolutions about *Saturn* and *Jupiter*, and retain their

Bodies for their Centre ; of which, four belonging to *Jupiter* and two to *Saturn*, were lately discovered by *Galilaus*.

Saturn, The slowest of the Planets, and most remote from the Earth, his Sphere being immediately next under the Heaven of the Fixed Stars by reason of which distance, he seems to us the least, though in truth greater than any of all the Seven, except the *Sun* and *Jupiter*: Of a leaden whitish, somewhat obscurish colour ; by Nature cold and dry, and so inimical to the Nature of Man and all Creatures, that he is generally counted the *Greater Infortune*. He is slow in Motion requiring 29 years, 157 days, and 22 hours to finish one Revolution in the *Zodiack* ; and his greatest North Latitude is 2 *degr.* 48 *min.* but towards the South 2 *degr.* 49 *min.*

Scalenum, [From *Scala*, the Latin word for a Ladder, with which this Figure has some remote resemblance] Is a kind of Triangle, having all its Angles and Sides unequal, whereby 'tis opposite to an Equilateral Triangle ; the Mean between them both is the Triangle called *Isoceles* which has two of its sides only unequal.

Scenography, [From the Greek words *Sené*, House or Tabernacle, and *Grapho*, to write or describe] Is a Model or Description of the Front and Sides of a Building, or the Art of rightly contriving Draughts in Architecture.

But in *Perspective*, the *Scenographick* appearance of any Figure, Body or Building, is that side that declines from, or makes Angles with that straight Line imagined to pass through the two outward convex points of your Eyes, generally called by Workmen the *Return* of a fore-right Side ; and

differe

differs from the Orthographick Appearance in this, that the latter represents the Side a Body or Buildings as it is seen, when the Plain of the Glasse stands parallel to that Side. But *Scenography* represents it as it seems through a Glasse not parallel to that Side. See *Practical Perspective*, fol. 4.

Sciography, [From *Scia*, Greek for a Shadow, and *Grapho*, to write or describe] Is the Art of Shadows, comprehending Dialling, and part of Astronomy, as far as serves for finding out the hour of the Day or Night, or other Question, by the Shadow of the *Sun*, *Moon*, or *Stars*.

Scheme, [From *Schema*, a Greek word, signifying a Form, Figure, or Shape of a thing] 'Tis used by Astrologers mostly for the Representation of the Celestial Bodies, in their true Places for any moment; or an Astrological Figure of the Heavens, often termed *Schema Cæli*, and the doing of it, *Erecting or drawing a Scheme*. 'Tis taken likewise for the Draught or Representation of any Geometrical or Astronomical Figure or Problem by Lines sensibly (to the Eye, though these are frequently called *Diagrams*).

Scorpio, [Latin, the *Scorpion*] The Eighth Sign of the Zodiack, and House of *Mars*. 'Tis called so, by reason of the sympathy it has with our Terrestrial Scorpions, who when the *Moon* is in this Sign, are said to be more fierce and dangerous. Nay, Authors affirm, that a House begun to be built when this Sign is on the Ascendent, will continually be haunted with Serpents. Its nature is prolifick, watery, and fixed; but venomous, treacherous, boasting, &c.

Secant, See *Sine*.

Second, The sixtieth part of a Minute.

Sector, [Lat. a Cutter] The Sector of a Circle is defined by *Euclid*, Lib. 3. to be a Figure contained under two Right Lines, which constitute an Angle at the Centre, and the Circumference comprised between the same Lines. Hence the word is used for a Mathematical Instrument of excellent use, whereof our worthy Artist Mr. *Edmund Gunter* has written a compleat Treatise, to which I refer you.

Section, To cut a Line or Figure in 2 parts, &c.

Section-conique, A Term in solid Geometry to cut the *Cone* into its usual parts, as to shew the Plain of the *Elipsis*, *Parabola*, *Hyperbola*, of which see Mr. *Anderson's Stereometrical Propositions*.

Segment, [Lat. from *Seco*, to cut] of a Circle Is a Figure comprehended under the Right Line and the Circumference of a Circle, whereby so much seems to be cut off from the rest.

Semicircle, [Lat. half of a Circle, whence in the Sphere and great Circles it imports always 180 Degr. and in the Zodiack six Signs; *Semis* in Latin signifying half.

Semi-fertile, **Semi-quintil**, **Quintil**, **Sesqui-quintil**, **Biquintil**, **Sesquiquadrate**. See *Lill*. 511.

Semidiameter, Half the Diameter.

Semiquadrat, [Lat. Half a Square] Is one of those new Aspects invented by *Kepler*, commonly marked thus, S. q. and happens, when two Planets are distant from each other the fourth part of the Semi-circle, or one Sign and 15 Degrees. This Aspect is chiefly regarded in Judgments on Diseases, or in Lunations concerning the Weather; for then the *Moon* becoming the visible, makes her effects manifest: Whence that vulgar Latin Proverb.

Quarta

Quarta, Quinta, Qualis; Tota Luna Talis.

As is the Fourth and Fifth days weather.
So's that Lunation altogether.

Separation, Is when two Planets have been in Conjunction or Partile Aspect, and the Lighter by reason of his Swifter motion, is going out of the moiety of both their Orbs. And this is twofold; First, Simple, when both are direct, but the lighter Planet in most Degrees. The second Mutual, when the Planet that is in most Degrees, is Direct, and he in the least Degrees Retrograde, for then there is a Separation made on both sides. The consideration of this is of great use in Astrology; for admit two Planets, being Significators in a Question of Marriage, are lately separated but a few minutes, we may judge there has been but few days before great probability of effecting the Marriage; but now it hangs in suspense, and there seems some dislike or rupture in it: and according to the number of Degrees that the swifter Planet wanteth ere he can be wholly separated from the more ponderous, so many days, weeks, months and years as the Signs are movable, common, fix'd, may it be ere the two Lovers will wholly desist, or see the matter quite broke off.

Septangulus, [From *Septem*, Latin for seven, and *Angulus*, an Angle] A Figure in Geometry consisting of seven Angles, whether it be Plain or Solid, Regular or Irregular. 'Tis sometimes called *Heptangulus* also, from the Greek word *Hepta*, seven.

Septentrional, [Latin, from *Septentrio*, the North] Northern, of or belonging to the North; so we say, *Septentrional Latitude*, and *Septentrional Signs*, as the first six Signs, because they decline towards the North from the Equinoctial.

Serpentine Line, A crooked winding Line, that incloses it self continually, as a Serpent wraps her self up in folds. See *Spiral*.

Sesquiquadrate, One of the new Aspects, when two Planets are distant from each other as much as makes a Square, that is, 3 whole Signs; and also half another Sign, that is in all, 4 Signs and 15 Degrees of the Zodiack. 'Tis of the same nature with the Square, unlucky, but in a less degree.

Sexagenary, [Lat. from *Sexaginta*, sixty] of or belonging to sixty. And indeed this Division of Degrees into 60 Minutes, and each Minute into 60 Seconds, is of great use in Astronomy; for being a Number divided by many, 'tis the most convenient for Calculation; to ease which the more, there are Tables called

Sexagenary Tables, Contrived of parts proportional, where by Inspection you may find the Product of two Numbers to be Multiplied, or the Quotient of two that are to be divided, &c.

Serangle, A Figure consisting of six Angles.

Sxtans, [Lat.] A sixth part.

Sextile, [Lat.] An Aspect, when two Planets are distant one sixth part of the Zodiack, viz. two whole Signs. 'Tis sometimes called in Greek *Hexagon*, which signifies the same thing. 'Tis of the nature of a *Trine*, good and friendly, but more weak and imperfect.

Shade

Shade, of Extuberance, The Shadow made by the greatest swelling part of a Body, more particularly of a Globulous Body.

Shank, Shifting of Tides. See *Marimer Mag.* fol. 6.

Sidereal Year. See *Solar Year.*

Signifer, [Lat. from *Signum*, a Sign, and *fero*, to bear or carry] The Zodiack is sometimes so called, because therein are all the 12 Signs. See *Zodiack.*

Significator, What in Horary Questions, and what in Nativities. See *Lilly* 507.

Signs, Are certain Notes in the Zodiack, divided by equal Twelve parts, each of which consist of 30 Degrees in length, and 12, or rather 18, in breadth. And that the Natures of them may be taken notice of, whether by reason of the Fixed Stars that are with them respectively; or by those effects which the *Sun*, passing through each of them, causes in things below; they are mark'd and called by Images and Names of Animals, or other things which might best represent their Qualities; in which the Antients were very curious, not to give Appellations at random, but after curious disquisition of all circumstances, so that it would be almost impossible to give them any other names, which should hint so many of their Properties as they already given do; which are, *Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces.* Now you must note, that all Stars are said to be in one of these Signs, not only those which are within the Latitude of the Zodiack, but those without it too: So that as if the Ecliptick were divided into 12 equal parts, and Circles from

folding of the Arms which we call a persons Bosom is called in Latin *Sinus*; so the space contained between Crooked shoars, which run out far like two Arms of the Continent into the Sea, in *English* called a Bay, is exprest likewise in Latin by this word *Sinus*. Hence by way of similitude, Geometricians call the Halves of the Chords, or Right Lines, which shut up the Cavity of any Arch, *Sines*.

Tangent comes from the Latin word *Tango* to Touch, and *Secant* from *Seco* to Cut, the reason of which Appellations are plain, the first being a perpendicular Right Line without a Circle, falling upon the end of the Diameter of the Circle, the second a Line drawn from the Centre of the Circle towards the first, and **Cutting** the Circle, which if continued long enough, the first must at length needs **Touch** it; but for more evident satisfaction, see Figure 1. where the Lines that are called Sines, Tangents, Secants, and their Complements have the word Sine, Tangent, Secant, &c. over them.

Sine,	}	Complement,	The Arch of a Circle numbred in Degrees, that any given Sine, Tangent, or Secant wants of 90 Degrees: as the Sine, &c. of 55 Degrees being given, its Sine, &c. Complement shall be the Sine of 55 Degrees.
Tangent,			
Secant,			

The use of these Sines, Tangents, and Secants, and their Complements, are very great in the Measuring all sorts of Triangles; as well Rectilineal, as Spherical: Of which see *Norwood's Trigonometry*, where they are largely Explain'd, also those called versed Sines.

Sinister

Sinister Aspect, } [Lat. Left-handed, or towards the
Left-hand] Is a proposition of two Planets that happens according to the succession of the Signs, as *Saturn* in *Aries*, and *Mars* in the same Degrees in *Gemini*; here *Saturn* is said to cast a Sinister Aspect to *Mars*, but on the Contrary, *Mars* beholds *Saturn* with a Dexter Aspect, because 'tis contrary to the succession of the Stars, and this *Sinister Aspect* is of more force than a Dexter one, says an Ingenious Modern Author (*Salmon Synopsis Medicinæ*. p. 14.) but acknowledges his opinion therein to be Contrary to that of the Ancients.

Sol, [Lat. the Sun] The King of the Planets, Fountain of Light, and Eye of the World, by nature hot and dry; a Fortune by Aspect, but Infortune by Body; he has many names given him, both by Poets and other Authors, as *Sol*, *Titan*, *Helios*, *Apollo*, *Pæan*, *Diespiter*, &c. His mean Motion is 59 m. and 8. s. sometimes but 57 m. 16 s. never above 61 m. and 6. s. never Retrograde, always without Latitude, because always in the Ecliptick, &c.

Solat Year, Is either Tropical or Sideral, Tropical [from *Tropè* a Greek word signifying Conversion, or Returning, whence the two Tropicks take their name] is that space of time wherein the *Sun* returns again to the same Equinoctial or Solstitial Point, which is always equal 365 days, 5 hours, and about 55 minutes; the Sideral or Starry year, is the space wherein the *Sun* comes back to any particular fixed Star, which is a little longer than the other; viz, 365 days, 6 hours, and 9 minutes.

Solid, Lat. Is a Body that hath both Length, Breadth,

Breadth, and Thickness, and all Solids are either Spherical or Elliptical, which have properly no Side or Angle; or Prisms, which are contained in Plains; or Trapezia's, which are Bodies Irregular.

Solid Number, Is so called by way of Analogy, being that which is made of three Numbers mutually Multiplying one another, which Numbers shall be called its Sides, as are 2. 3, 4. in respect of 24.

Solstice, [In Lat. *Solstitium* from *Sol* the Sun, and *Sto* to stand] Is that time when the Sun Entering the Tropical Points it got furthest from the Equator, and before he returns back towards it, it seems for some days at a stand, being moved in the same Parallel, scarce making any Lines but almost perfect Circles, so small is his progress; these *Solstices* are two; the *Estival* or Summer Solstice, when the Sun Enters *Cancer* the 11th of June, making the longest Day and shortest Night, and the *Hyemal* or Winter Solstice on the 11th of Decemb. when he Enters *Capricorn*, the Nights being at longest, and the Days at shortest: But this is only in these Northern Regions, for under the Equator there is no variation, but a continual Equinox, and in the Southern parts *Capricorn* makes the longest Day, and *Cancer* the longest Night.

Solution, An unfolding, explaining, or giving satisfaction to any Question, from *Solvo* in Latin, to loose or unty.

Speculum, [A Latin word signifying properly a Looking-Glass, but used for a kind of a Table framed by Astrologers after they have erected the Figure of a Nativity; containing the Planets and

and Cusps with their Aspects, Terms, &c. all in their proper places; thereby to find out the progression of the Significators to Promittors, and Rectify the Estimate time of the Scheme by Accidents; See the Form and manner of drawing it, in Mr. Coley's *Clavis Astrologiae*, &c.

Sphere, [A Greek word, in Latine *Globus*, a round thing or Ball in English] Is defined in Geometry by *Euclid* to be, A Solid Body, contain'd in one only Superficies; in the midst whereof there is a Point conceived, to which all Lines drawn from the Superficies are equal.

But in Astronomy 'tis taken more specially for the whole Frame or Machine of the World, being of a Spherical Figure: but most strictly, for the *Primum Mobile*, embracing all the other Orbs and Celestial Bodies, which, in the space of one Natural Day, isvolv'd and carry'd round on the Poles of the World about the Earth, according to *Ptolemy*; and which by reason of its different habitude, or respect of the parts of the Earth to its Poles, is said to be either Right or Oblique.

A Right or Direct Sphere hath both the Poles of the World in the Horizon, and the Equinoctial transiting the Zenith; so that all the Circles parallel to the Equator make Right Angles with the Horizon, and by it are divided into two equal parts, the *Sun*, *Moon*, and *Stars* being always 12 hours above, and 12 hours below the Horizon; consequently the Days and Nights always just 12 hours long: and is called *Right*, because all the Celestial Bodies, by the Diurnal motion



motion of the *Primum Mobile* Ascend directly above, and Descend directly below the Horizon : As at the Isle of *St. Lawrence*; and other places under the Equator. The aforesaid Figure is a representation of the Right Sphere.

An Oblique Sphere is, where one of the Poles is elevated above, the other depressed below the Horizon, as in all places wide of the Equator. The adjoynd Figures is a representation of the Oblique Sphere.



A *Parallel Sphere* is so called, because there the Equator lies directly in the Horizon, and is parallel thereunto; the whole year there being but as one Natural day, viz. one half year Day, and the other Night. The adjoyning Figure represents a Parallel Sphere.



From this division of the Sphere arises the diversity of Ascensions, to wit, of the Degrees of the Equator, and parts answering thereunto, thence denominated *Right* or *Oblique*. For in a Right Sphere, all the Ascensions are Right; but in an Oblique Sphere, Oblique.

All which is demonstrated sensibly in that Mathematical Instrument called the Sphere, which hence takes its name, having the Poles, Lines, and Great Circles therein represented.

Besides this, the Orb of each Planet is called, the Sphere of such a Planet: and sometimes the word

word is likewise used for the Sphere of a Planets Activity, and that extension of Light and Vertue, so far as any Planet is capable of making or receiving a Platick Aspect; and how far that is respectively in each, see **platick**. See also **Atmosphere**.

Spheroides, Is a solid Figure made from the Plain of an *Elipsis* turned about upon its *Axis*, and Explain'd in most Geometrical Authors.

Spiral Line, [Lat.] A Tortuous or Crooked Line, unequally distant from the midst of the space, howsoever inclosed, which seems to be almost a Circle, only it does not meet, and like that, run again into it self, but keeps on at a proportionate distance or deviation, like the Coiling of Ropes, or the folding of a Serpent, when she lies close in so many Turns with her Body, and is therefore sometimes called a Serpentine Line.

Square, In Geometry, is a Figure that is Equilateral and Right Angled; that is to say, which hath the four Sides equal, and the Angles Right. But in Astrology, a **Square** in an Aspect between two Planets that are distant a fourth part of the Circle, or 90 Degrees, for from those Points Lines drawn to one another, will make a perfect Equilateral Rect-Angled Square. This is an unfortunate Aspect, but not so prejudicial as an *Opposition*.

Square Number, A Number equally even, or contained under two equal Numbers; as 25, which rises equally even by the mutual Multiplication of 5 into or by 5.

Square Root, Is any Number, which being Multiplied into it self, makes a Square Number. So 25 is the Square of the Side or Root 5.

Square

Square, Called in Latin *Norma*, *Gnomon*, or *Canon*, as an Instrument consisting of two Shanks, including a Right Angle, commonly known to, and used by Carpenters, &c.

Squaring the Circle, Is a contriving to any Circle a Square equal thereunto, and exactly correspondent: A thing that has puzzled the ablest Mathematicians, being in truth, to find out the Area of some Square that shall be exactly equal to the Area of some Circle, so that the Area's of both Figures shall be alike capacious. This, though the great *Archimides*, and others, have not exactly done, yet they have come near enough for any use, and taught those things, which, if fully understood and pursued, the Circle may come to be Squared: For if they have Squared a Parabola, (which is an Area intercepted between two Lines, one Right, and the other Arcular, or bowing) why should not the Circle it self, which consists of two Parabola's, be as well Squared?

Sporades, [from the Greek *Sporos*, scattered up and down, or in several places] Are those Stars dispersed in the Firmament, which were never set rank'd in any particular Constellation, nor had peculiar names assigned. They are called thus by way of Analogy, from the Islands called *Sporades* near *Crete* in the *Carpathian* Sea, which were so described by *Ptolomy*, nor inserted in the old Maps.

Stade, A Measure or Term in *Geography*, and *Architecture*, also in use among the Ancients, and in Foreign Countries.

Stationary, } [From Lat. to *Stand*] The
and } Consistence of the Planets in
Station, } their Eclipses, when they are

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furthest

furthest of their Centre in respect of the Zodiack, and being to be either Direct or Retrograde, is called their Station. To understand which, we must note, that all the Planets, except the *Moon*, are moved in their final Orb or Epicycle about the *Sun*, whom they respect as the Centre, (according to *Tycho*) and in the meantime both they, and their great Orbs, or Distances, are carried about by the *Primum Mobile*, yet keep on their proper Motion according to the succession of the Signs, and have four remarkable Points: First their Apogæum, where they are furthest from the Earth, and are all above the *Sun*, joyned with him in the same Ecliptical Degree, whereby the Superiors become Oriental but the Inferiors Occidental. The second is the Perigæum, where they are below the *Sun*, and nearest to the Earth, yet joyned again to the *Sun* in the same Degree of the Ecliptick, and from thence the Superiors become Occidental, and the Inferiors Oriental. The other two Points are on each side, in which they are farthest removed from the *Sun*, and are called their *Stations*, because as they are Ascending therein to their Apogæum, or Descending therein to their Perigæum, they seem in a manner to stand still, and not change their place in the Zodiack: Of which the first Station is that on the right hand of the *Sun*, where they began to go backward in the Zodiack passing by their Perigæum to their second Station when being on the left hand of the *Sun*, they begin to grow Direct.

Hence a Planet is said to be *Stationary*, when he is about either of these his Stations; Ascending or Descending in his Epicycle to his Apogæum

or Perigæum, for that he seems not at all, or insensibly at least, to be moved in the Zodiack, but persisteth long in the same Degree, as long as he Ascends or Descends in those parts of his Orb, which are directly under one Degree of the Zodiack.

Sterenometrie, [From two Greek Words *Stereon*, a Solid, and *Matria*, a Measure] Is none of the least amongst the Mathematical Sciences, and properly a Branch or Handmaid to Geometry; treating of Measuring all sorts of Solid Bodies.

Stilbon, [From the Greek Word *Stilbos*, bright shining] One of the names of the Planet *Mercury*, because he twinkles more than any of the rest of the Planets.

Steriography, Or the Description or Drawing of the Forms of Solids upon a Plain, &c.

Statics, The Science of Weights and Measures, a Species of the Mechanics, shewing the Properties and Motion of Ponderosity, or Heaviness and Lightness of Bodies, &c.

Sublunaries, [From the Latin *Sub*, under, and *Luna*, the Moon,] All things below the Moon, as the Elements, and all things mixt or composed of them, whether Perfect or Imperfect, Animated or Inanimated, all being liable to the Influences of the Celestial, and especially the Impressions of the Moon, as the common Conveyancer of the superiors Vertues down to their Inferiors.

Stratarithmetrie, [From the Greek *Stratos*, an Army, and *Arithmetice*] Is the skill appertaining to War, by which a Man can set in a Figure analogical to any Geometrical Figure appointed, any certain number or sum of Men of such a Figure are capable, and certifie of the over-plus (if any

be) and of the next certain sum, which, with the over-plus, will admit a Figure exactly proportional to the Figure assigned. By which skill also, of any Army or Company of Men (the Figures and Sides of whose orderly Standing or Array is known) he is able to express the just number of Men within that Figure contained, or (orderly) able to be contained: And this Figure and Side thereof he is able to know either by, & at hand, or afar off. See *Dr. Dee's Preface to Euclid's Elements*.

Stylobata, The Pedestal or Foot-stool of a Colum or Pillar, a Term used in *Architecture*.

Stile, The Gnomon or Cock of a Dial, that casts the Shadow upon the Hour-Lines.

Succedent-Houses, Are so called, because they succeed or follow Angles in a Celestial Figure as the 11th. the 2d. the 5th. and the 8th. which succeeding, is yet not so much in Order, as in Condition and Dignity: For a Planet in them is counted moderately strong, though not so much as in Angles; whereas in Cadent Houses he is most of all debilitated.

Sud, An odd word used among Sailors, as the Wind, &c.

Subtense, or **Chord Line**, [Lat.] Is a Line drawn under an Arch of a Circle, or a Right Line drawn within a Circle, at each end terminated to the Circumference, cutting the Circle beside the Diameter into two unequal parts, to both of which it is subtended, that is, hung or drawn underneath them.

Subtraction, [Lat. from *sub* and *traho*, to wit draw] A common Rule of Arithmetick, teaching how artifically to take a lesser Number out of a greater, and find what remains over-plus of the

greater

greater, when the value of the smaller is substra-
cted, that is, withdrawn, or taken away from it.

Succession of the Signs, Is that order in
which they are usually reckoned; as first *Aries*,
next *Taurus*, then *Gemini*, &c.

Sunday-Letter. See *Dominical Letter*.

Summer Solstice See *Festival Solstice*.

Superficies, As much as to say, *Supernafacies*
in Latin, that is, the uppermost or outward face:
for by this word, Geometricians mean the exter-
nal part of any Body, which is beheld with the
eyes, and touch'd with the hands, being defined
by *Euclid* to be a Longitude and Latitude with-
out Depth or Thickness: Whereby it differs
from a *Point*, which has no Dimension; from a
Solid, that has all kinds of Dimension; and from
a *Line*, that enjoys only Length, and is void of
both Breadth and Depth. There is the Superficies
of a Sphere of a Cone, of a Cylinder Cnoyd
Parabolique, Hyberbolique Eliptick, or the Face
or outside Covering of those solid Bodies, well
known to Expert Geometricians, &c.

Superiors, *Saturn*, *Jupiter*, and *Mars*, are cal-
led so by way of Eminence, because their Orbs
are above the *Sun*; as the other three Planets,
Inferiors, for the contrary reason.

Symmetrie, A Greek word signifying *Propor-*
tion, but it is usually meant a Faculty acquired by
Precepts of Geometry which in Architecture pur-
sues the Order of Nature, and makes all the
parts of any Structure compleatly agree to, and
with the whole.

Supplement, That which Compleats or
Supplies.

Surd, [In Latin properly Deaf or unreasonable]
whence *Euclid* calls Figures Incommensurable to

the Rational Square, *Surds*, and so likewise Line Incommensurable to, (that is, having not any common Measure with,) the proposed Rational Line, are called *Surds*, or Irrationals, or things Inexplicable.

Sur-solid, Or the 5th power from the Root of a Side in Number: As suppose 2 is the Root of a Side, the 4 is the 2d power, 8 is the Cube of the 3d power, 16 is the Squared Square or 4th power, 32 is the 5th power of 2, and is called the *Sur-solid*, 64 the 6th power or squared Cube, 128 the 7th power, or the second *Sur-solid*, &c. as is plainly taught in all Books Introductory to *Algebra*.

Surface, See *Superficies*, being the same.

Swift in Motion, A Planet is said to be so when by his own proper diurnal Motion he exceeds or moves further than his mean diurnal Motion! Which is accounted amongst the Chief Fortitudes of a Planet: As to be *slow in Motion*, that is when his Motion happens to be less than his mean motion is a great Debility the reason whereof see in the word **Retrograde**. The mean Motions of all the Planets are daily (that is in the space of 24 hours) as follows,

Saturn 2 Minutes, and 1 Second, *Jupiter*, 4 min. 59 sec. *Mars* 31 min. 37 sec. the *Sun* 59 min. 8 sec. *Venus* 59 min. 8 sec. *Mercury* 59 min. 8 sec. and the *Moon* 13 deg 10 min. and 36 sec. in a day.

So that you need only look in an Ephemeris and take the diurnal Motion of a Planet by Subtracting his place the day before, if he be direct

ect, or the contrary, if Retrograde, and you have his present Motion, which compared with this Table, you see whether he be to be counted Swift or Slow. Note, you will find some Planets move much further sometimes in a day, but these are their true mean Motions, which if exceeded he is reckon'd *Swift*, and the more he exceeds it, so much the stronger.

Symboles, Are Letters used for Numbers in Algebra, or Arithmetick in Species.

Symtots, Used by Dr. Wallis, 'tis a Term in Solid Geometry, and largely explained by most Authors that treat thereof, and of Operations therein by *Algebra*.

Synodus, [A Greek word signifying a meeting or Convention] used by Astronomers commonly for a Conjunction of two or more Planets, and sometimes for their meeting by Beams in other Aspects.

Synopsis, A brief and orderly Representation or view taken of a thing.

Systeme, A Greek word whereby is intended the general Constitution, Fabrick and Harmony of the Universe, or an orderly Representation thereof according to some noted Hypothesis, wherein the Celestial Bodies are so disposed amongst themselves, and in respect of the Earth, as their Scituation, Order, Motions and Passions, may in such an Authors opinion best answer Appearances and Philosophical Demonstrations; To this purpose the Ancients agreed, that the Globe of the Earth and Sea should be the Centre of the World, about which was diffused the Air, and round that the more light Element of Fire; Then the Orb of the *Moon*, and so *Mer-*

cury, Venus, Sol, Mars, Jupiter and Saturn, in order, all respecting the Earth as their Centre; after which they placed the Firmament or Orb of the Fixed Stars, and last of all the *Primum Mobile*.

But of late, *Copernicus*, (a most ingenious Astronomer) the better to Solve the appearances Invented, or rather revived; for it was many Ages before started by some old Philosophers, but now buried and forgot) he, I say, revived another Hypothesis, which constitutes the *Sun*, Immoveable in the Centre of the World, next the Orb of *Mercury*, then *Venus* in the third place the Globe of Earth, with the *Moon* continually moving about it, to which Globe of Earth, he assigns a threefold Motion, *Diurnal*, in 24 hours from West to East, which was before attributed to the *Primum Mobile*, *Annual*, which the *Sun* antiently challeng'd, and a third of *Libration*, whereby he resolv'd the Inequality of the Equinoxes, and obliquation of the *Ecliptick* from the Equator, for the 5th. Planet he places *Mars*, then *Jupiter*, then *Saturn*, and last of all the Sphear of fixed Stars.

Since this, the Noble *Tycho Brahe* proposed his Hypothesis, making the Earth the Centre of both the Luminaries, and the Orb of fixed Stars, but the *Sun* the Centre of the other four Planets; whom he counts all Eccentrick to the Earth, and constantly moving in the fluid Ether about the *Sun*, &c.

All these Systemes have found their Disciples, and Propugnators: If any have a mind to be better Instructed in all or any of them, there are Sphears extant fitted for every one of them, and shewing

ing all the Motions and Affections of the Celestial Bodies truly, according to the intention of each Hypothesis.

Syzygiæ, [The word originally Greek signifies a Marriage, Society, or Familiarity,] but is used for the Entercourse of the Planets one with another, or the Commixtures of their Beams, either by Corporal Conjunction, or other Aspects; and therefore you shall find in some Ephemerides over the Left hand page, *Syzygiæ Lunares*, that is, the *Lunar Aspects*.

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Tables Larodromiques, or Tables of Traverses in Navigation, you may see a large one in *Sir Jonas Moor's System of Navigation*, in two large Quarto Volumes, Printed but few years since, for the use of the Boys designed for Navigation in Christs Church *Hospital*.

Table of Houses, are Tables Calculated for the Assistance of young Artists in setting a Figure; for by the help thereof the meanest Capacity may presently Learn to do it, but without them it would be exceeding difficult. See *Tutor to Astrology*.

Tare, See *Tret* and *Tare*, discours'd in most Books of Arithmetick.

Tangent. See *Sine*.

Taurus, [Lat. the *Bull*] the second Sign of the Zodiack, Fixed and Earthly, the House of *Venus*,

Venus, and Exaltation of the *Moon*, called by this name, because 'tis found by Experience, Persons born under it are Laborious, but slow of Apprehension, and have high Foreheads, and sticking out on both sides like Bullocks; or rather because this Sign does more peculiarly Affect such Cattle; and being possess'd with an Infortune, threatens Murrain and Destruction to them.

Telescope, [Gr. a large Optick Instrument, invented by *Galileus*, for observing the Celestial Bodies, whereby several new Phenomena have been discovered and great Improvements made in Astronomy.

Tenail, A Term used in Fortification. See *Authors*.

Temperate Zone. See *Zone*.

Term, In Geometry is the bounds or limits of a thing, as a Point of a Line, &c. 1st. 2d. 3d. &c. middle Term in *Trigonometrie*.

Cerilla, A little Body or Instrument that Represents the Earth; some are cut in *Loadstones*.

Terms, In Astrology, are certain Degrees of the Signs, in which such respective Planets have been observed to have their Virtues and strength encreased; whence a Planet in those Terms is said to have two Dignities; To know what Terms each Planet has. See the ordinary Table of *Essential Dignities*, every year in Mr. *Lil- lies Almanack*.

Tetrahedron, [From the Gr. *Tetra* four and *Hedron* a Side] A solid Figure comprehended under 4 equal Equilateral Triangles.

Tetragonus, or **Tetragonum**, [from the Greek *Tetra* four, and *Gonia* an Angle] Signifies any Figure consisting of 4 Angles; but is used generally

nerally by Astronomers for a square Aspect.

Chaumaturgick, [A Greek word signifying the Wonder-working] Is one of those Arts mentioned by Dr. *Dee* in his Preface to *Euclid*, and by him Defined to be that Art Mathematical, which giveth certain order to make strange works of the Sense to be perceived, and of men greatly to be wondred at. See Dr. *Dee*'s Preface to *Euclid*.

Theodelite, A Mathematical Instrument for the Surveying of Land. See *Rathbourn's* Surveying.

Theme, Is frequently used by Astrologers for the Position of the Superior Bodies at any moment, when they require the success of any thing then begun, or proposed: Calling their Figure *Thema Cæli*.

Theorem, A Greek word signifying a Proposition, which requireth the searching out, and demonstration of some Property or Passion of some Figure, wherein is only Speculation and Contemplation of mind, without doing or working of any thing; whereby it differs from a Problem, in which something is always to be done: Or I may say, **Theorem** is a Proposition, shewing how to work a Question in Arithmetick or Geometry, a Rule prescribed. See *Euclid's Elements*, where you have the Definitions of Propositions, Theorems, Problems, &c. Thence comes the word Theory, of any Art or Subject matter, and from Theory or Speculation, the Practick part, &c.

Topographie, [Gr. from *Topos* a place, and *Grapho* to describe] The Description of some particular place; See **Chorographie**.

Thermometre and **Barometre**, Instru-
ments

ments now used in Glass Tubes, the one shews the Weather, either Hot or Cold, and how it changes to either : And the other Wet and Dry, by the Rising or Falling of the Spirits in the Tube of the one, and the Quicksilver in the other ; they are now common, and called vulgarly *Weather-Glasses*.

Chord Zone. See *Zone*.

Translation of Light and Nature, Is when a Light Planet separates from a more Weighty one, and presently Joins to one more Heavy ; As suppose $\hbar$ in 20 Degrees of γ , δ in 15 of γ and φ in 16 of γ , here φ being a swift Planet separates from φ and translates his Virtue to *Saturn* ; which purports in Judgment, that if a thing be promised by $\hbar$ then such a man is signified by φ shall procure the assistance of a *Martial* man to *Saturn* to effect the Business ; be it a Marriage, a Suit, or the like.

Transom, The Vane of a Cross-staff, viz. A wooden member to be set across the Cross-staff, having a square Socket in it, upon which it slides stiff upon the square of the Cross-staff, and may be set to any of the Graduations on it.

Transits, [from the Latin Verb *Transseo* to pass by or over] are a kind of Familiarities of the Stars, acquired by their Motion, through remarkable places of a Persons Radical Figure ; as if the Ascendant be *Sagittary*, and *Jupiter* at any time by his proper Motion pass over the Degree Ascending ; the Native is then healthy and fortunate, if *Mars*, he is moved to Choler, imbroil'd in Quarrels, &c. And oftentimes agreeable Transits do bring into Act the matter signified by a Direction, whereby we may nearly

gues

gues of the Day, when any considerable accident will happen.

Traverse, A Term in Navigation. See *To cast a point of Traverse*.

Trapezia, Are all sorts of Irregular Figures in Geometry, that is, such were neither the Sides nor Angles equally Correspond. The word seems to come from the Gr. *Trapeza*, a Table.

Trapezoides, Are a Species of *Trapezi's*, for they comprehend all solid Irregular Figures, which have not Parallel Sides, and these are such, as either are altogether Irregular, or that in some thing observe a kind of Rule of Equality; as Prisms, &c.

Triangle, A Figure with three Angles, whence also the word **Triangular**, of or belonging to such a Figure.

Trigon, In Greek, is strictly the same with Triangle in Latin; but is used for the Aggregate of three Signs of the same Nature and Quality, beholding each other with a Trine Aspect, and are accounted according to the Four Elements; Thus *Aries*, *Leo*, and *Sagittary* are the Fiery Trigon, or Triplicity, *Taurus*, *Virgo*, and *Capricorn* the Earthly; *Gemini*, *Libra*, and *Aquary* the Aiery; And *Cancer*, *Scorpio*, and *Pisces* the Watry. Hence.

Trigonocratores, [*Creator* in Greek signifying a Governor] the Lords of these Trigons, viz. *Sol* and *Jupiter* of the Fiery; *Venus* and the *Moon* of the Earthly, *Saturn* and *Mercury* of the Aiery, and *Mars* alone of the Watry.

Trilateral, Three Sided.

Trigonometry, [A Greek word compounded of *Treis* three, *Gonia*, an Angle, and *Metria* Mea-

Measure] A Mathematical Science, teaching how to resolve all Triangles as well plain as Spherical: whereby three Sides or Angels being given out of six contained in a Triangle, the other three unknown are found out; In order to which, the Tables of Sines, Tangents, and Secants, are of use; as shewing the Quantity of the half Chords, which are subtended to parts of the Circumference within the Circle.

Trimorion, Gr. the Aggregate of three Signs Contiguous, by which there is constituted a square Aspect to the *Apheta* or *Giver of Life*, who coming to that Direction commonly cuts off the Vital Thread; And therefore since 3 Signs, *viz.* 90 Degrees may sometimes give 120 Degrees of Direction and not more, therefore some think 120 years to be the utmost Extent generally of Humane Life since the Flood.

Tripartition, Or to Divide any Number or Solid into 3 equal parts, &c. and so the word Triple, shews you must multiply by 3, or double any Number 3 times, &c. Hence Tripartition tells you are to Divide by 3, and Triple to multiply by the same Number, &c.

Triplicity. See *Trigon*.

Trine, Lat. an Aspect of Friendship and Amity between 2 Planets distant from each other a third part of the Circle, that is, 120 Degrees.

Trochilike, The *Wheel-Art*, or the Mathematical Skill Demonstrating the Properties of all Circular Motions, Simple and Compound; Derived from the Gr. *Trochos* a Wheel.

Tropicks, [from the Gr. *Trope* a Conversion or turning] Two lesser Circles in the Sphere equally distant from the Equator, *viz.* 23 Degrees on each side, being the bounds of the

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Suns Deviation from the Equinoctial, which when he touches he seems to stand still, and soon returns towards the Equator: The Northern one is called the *Tropick of Cancer*, that makes our longest Day, the Southern one the *Tropick of Capricorn* that makes our longest Night.

Trutine of Hermes, [properly a Trowel, and sometimes a Measure] An Artificial method of Rectifying a Nativity by finding out the day of Conception and the place of the *Moon* then: said to be Invented by *Hermes Trismegistus*; but the same being common in most Authors, and what makes it the less considerable, not much regarded; but the Rectification by Accidents generally followed, I shall not here set it forth at large. Those that would make use of it (and in Childrens Nativities Calculated before Accidents having happened it may be of use) may see the manner of doing it in Mr. Coley's *Clav. Astrol.*

Tuscan-Order, One of the five Ancient Orders in Architecture; used by the *Tuscans* in Italy: For the Form of it, and all the other Orders; See *The Compleat Architect.* p. 16.

V

Vane. See *Transum.*

Variation of the Needle, The Turning or Deviation of the Needle in the Mariners Compass some small matter from the true North Point, which happens more or less in all parts.

Venus, [Some say from the Latin, *Venio*, to come, because every body, sooner or later, comes to Loves dotage, of which she is Lady] The brightest

brightest and most resplendant of all the Stars, whether Erratick or Fixt, the *Sun* always excepted; and this not because she is bigger than the rest, but because she is nearer the Earth than any of them, except *Mercury*, as appears by her having Parallax of almost 3 Minutes; whence it may also be gathered, that she is less than the Earth. 'Tis a Feminine Planet, accounted the Lesser Fortune, and finishes her Revolution about the *Sun* in the space of almost one year, and when she is at her greatest Elongation from him, (which is never above 48 Degrees) shines so bright as to cast a shadow: Yea, by the help of the Telescope it hath been observed, that she changes her appearances, and has almost the same variety of *Phases* as the *Moon*, so as sometimes to seem Full, sometimes Half-full, sometimes Horned, and sometimes not at all, viz. when she is above or under the *Sun* in Apogæon or Perigæon of her Epicycle, joyned to him in the same Degree of the Ecliptick.

Uerfed Sine. See *Sine* and *Scheme 1.*

Vertex, In Latin, is the Point in Heaven just over our Heads, Perpendicular to the place where any one Lives. Hence a Star is said to be **Vertical**, that happens to be in that Point, and Vertically hangs over any place; and so the Equator is said to be **Vertical** to them who have a continual Equinox; because, it constantly passes by the Vertex of the Place, and the *Sun* at Noon darts down his Rays so perpendicularly, that no shadow is produced; this point the *Arabians* call **Zenith**; which see afterwards: 'tis called *Vertex*, [which in Latin signifies the Top of a Mans Crown,] by reason it is so right over head, as aforesaid.

Uesperine

Vesperine, When a Planet sets after the *Sun*.
See *Martine*.

Vesperugo, The Evening-Star, *Venus*, when she shines after *Sun-Set*; both the words come from the Latin *Vesper*, the Evening.

Vibration, The Motion of a Pendulum in a Clock, which moves in the long sort a Secant in Time backward and forward.

Via Combusta Lat. See Combust way.

Via Lactea Lat. See Milky way.

Violent Signs, Are those which the Malefick Planets, viz. *Saturn* or *Mars* have any notable Dignities, as House or Exaltation, such are ν , π , ρ , σ , and τ . And also those in which there are any violent fixed Stars of note, and within the Zodiack, as *Taurus*, for *Caput Algol*, and others.

Virgo, [Lat. the Maid or Virgin,] the 6th. Northern Sign of the Zodiack, next to the Autumnal Equinox, and therefore Common: by Nature Earthy, Cold and Dry, the House and Exaltation of *Mercury*.

The Visual Point, in Perspective, is not that Point the Eye is placed in (as young Students in that Art are apt to think,) but is a Point in the Horizontal Line, wherein all the Ocular Rays unite; As if ye were in a long straight Gallery, where the two Sides, the Floor and Cieling seem to incline and touch each other in a Point or common Centre, which Point reflected on a Glass erected perpendicularly on the Base, is called the *Visual Point*. See *Practical Perspective*, Fol. 6.

Umbilique Points, or the 2 Focus or Centre-Points in an *Elipsis*.

Unformed Signs, Such are those that are called *Nebulæ* or Cloudy, scarce to be seen by the bare Eye or Instrument.

Unite } An Unite is the beginning of Num-
or } ber, and (Properly, for here we
Unity. } speak not of Fractions) receiveth no
division in Numbers, even as a Point in Magni-
tudes; or thus Unity is defined by *Euclid. L. 7*
Unity is that according to which every thing of
those which are, is said to be one.

Under the Sun-Beams [*Sub Radius, scilicet Solis,*] Is when any Planet is not fully Elongated or distant 17 deg. from the body of the *Sun*, either before or after him; this though not so bad as Combustion, which is only till a Planet is got 8 deg. 30 min. from him, yet still 'tis an Affliction and reckoned 4 accidental Debilities.

Uoid of Course, A Planet is said to be so, when he is separated from one Planet, and doth not during his being in that Sign, Apply to any other, either by Body or Aspect; This is most observed in the *Moon*; You shall seldom see a Business go handsomly forward whilst she is so.

Umbra, A Shadow, a word oft used in the Observation of Eclipses. And also *Pennumbra*.

Uortex, A Term used in Astronomy, applied to the Motion of some of the Planets, and signifies a Motion like to that of a Whirl-pool.

Watch, A Sea phrase, signifying 4 Hours, they measure it by a Glass, whose Sand in 4 Hours running out.

Winter Solstice. See Solstice.

Matry Triplicity, The Signs so accounted be
ing Cold and Moist, are ♄, ♀ and ♁.

There are 4 Triplicities, viz. Fiery $\gamma \Omega \psi$,
Earthy $\alpha \mu \nu$, Airy $\pi \rho \sigma$, the Fiery, Hot
and Dry, the Earthy, Cold and Dry, the Airy
Hot and Moist, &c.

Y

Yacht, A small Vessel, or Pleasure-Boat.

Z

Zenith, An *Arabick* word, signifying the Point in the Heavens right over ones head, being necessarily 90 Degrees from the Horizon. See *Mercur.*

Zigiatus, Some Astrologers call every person so, that is born under *Libra*: of whom *Ptolomy* in his *Centiloquium* pronounces, *That he shall be the Cause of his own Death*; the reason of which Aphorism *Pontanus* gives, because when $\cap$ is Horoscopical, *Taurus* will be on the Cusp of the 8th, and both Signs being under *Venus*, therefore the party will be apt to occasion his own Death. But we know the Stars do but incline, not compel, and have no force upon the free will of Man, which this Aphorism would seem to Infer: more reasonable it is, to conclude these *Zigiat*i (as they will call them so) for the most part do make good Poets, Musicians, Orators, &c. And to be of a good pleasant Humour, and delightful to Society, as well because *Libra* is the House of *Venus*, as by reason of that most benign and pleasant Star *Spica Virginis* therein, upon the Ascendant.

Zodiack, Gr. Is the Greatest Circle in the Sphere, being 12 Degrees broad, as the Ancient Astronomers thought; but the Moderns better acquainted with the Motions of $\♂$ and $\♀$ assert it to be 18, Cutting the Equinoctial into two equal parts; in the midst of it is the Ecliptick, under which the *Sun* constantly moveth, leaving on each side 6 Degr. of Latitude: 'Tis called the Zodiack from the Greek word *Zoon*, a Living Creature; because herein are the 12 Signs, which for the most part are called by their names, and represented in the shape of Living Creatures; The whole Circle is divided by the 12 Signs into 360 Degrees; 'Tis from them called *Signifer* and often times the *Oblique Circle*.

Zones, Are certain broad Circles, Encompassing

fining the Heavens and Earth like a Belt, or Girdle; whence the Name, [for *Zona* is Latin for a Girdle:] On the Earth, It is a space contained between two Parallels, and the Ancient Geographers reckon'd them to be 5 in Number, Two Frozen, Two Temperate, and One Burning Zone, of which they Imagined only the two middlemost Habitable; The Two Frozen Zones, are those parts of the Globe Comprehended between the North-Pole and the Artick Circle, and the South-Pole, and the Antartick Circle, which they thought could not be Inhabited by reason of the Extream Cold.

The *Temperate Zones*, are the spaces contained between the Artick Circle, and the Tropick of *Cancer* on the outside, and the Antartick Circle, and the Tropick of *Capricorn* on the other; and between those two Tropicks lay the *Torrid* or *Burning Zone*, which they fancied to be Un-inhabitable by reason of the Excessive Heat; but we have now discovered their mistakes, and find not only the Cold Countries somewhat near the Pole, but the warmer Regions under the Equator, to be Plentifully Inhabited: In which last, notwithstanding the *Suns* Perpendicular Rays at Noon, 'tis most pleasant Living, partly by means of the Plenty of Fountains and Water, and chiefly by the Equality of the Night, and gentle Breezes continually refreshing them about Noon.

Zeteticque, Numbers used in Algebra and Equations by the famous *Vieta*.

AN APPENDIX,

Of Weights, Measures, &c.

Measures of Length.

THree Grains of Barley Dry and Round make an Inch; 'Tis called in Latin *Unica*, and sometimes in English, a Thumbs-breadth.

12 Inches make a Foot.

3 Foot a Yard, the 6th part whereof, viz. 2 Inches and $\frac{1}{4}$ is called a *Nail of a Yard*.

A Yard and a Quarter makes an *Ell*, that is to say, 3 Foot 9 Inches.

Five yards and an half, (that is, 16 Foot and an half) do make a *Rod, Pole, or Perch*, Statute Measure; But the Geometrick *Perch* or *Gad*, is 10 Foot, and in some places but 9 Foot.

Forty Perches in Length, and 4 in Breadth, make an *Acre* of Land; a Quarter of which, is called in some Places a *Rood*.

For all this, See the Statute 33 *Edw. I. de Terris Mensurandis*.

40 Poles or Perches, make a Furlong.

8 Furlongs, viz. 320 Rods, make a Mile.

This is likewise Settled by Act of Parliament. See the Stat. 25 *Eliz. An Act to restrain New Buildings, &c.*

So that in an English Mile there are

320. — Rods,
5280. — Feet,
And 63360. — Inches.

A **League**, Is a Measure commonly reckoned at Sea, and contains three such English Miles as of Degrees in Heaven, is reckoned to contain 60 English Miles. See Degree.

Besides these, there are some other Measures of Longitude, as,

A **Fingers-breadth**, [called in Latin *Digitus*] containing 2 Barley Corns Length, or 4 laid side to side.

An **Hand-breadth**, [*Palmus*, or *Palmus Minor*] Three Inches.

A **Span**, [*Spithama*, or *Palmus Major*] 3 Hands-breadth; or 9 Inches.

A **Cubit**, Half a Yard, or 2 Spans, being Counted from the Elbow to the Top of the Middle-Finger.

A **Step**, [*Gradus*, or *Passus Minor*] Two Foot and an half.

A **Stride**, [*Passus*, or *Passus Major*] Two steps, or 5 Foot; from these the Romans Counted heir Mile, calling it *Miliarium*, that is *Mille passus*, a 1000 Paces; but our English Mile you see before, is 56 Paces more.

A **Fathom**, Six Foot.

Of Liquid Measures.

THese amongst us in *England*, are varied in their Contents according to the several Liquors they are to Measure, As,

1. For *Beer-Measure*, 35 Cubical Inches and a Quarter do make a *Pint*.

Two Pints, a *Quart*.

Two Quarts, a *Pottle*.

Two Pottles, a *Gallon*.

Nine Gallons, a *Firkin*.

Two Firkins, a *Kilderkin*.

Two Kilderkins, a *Barrel*, in which, (it appears from hence, that) there are 36 Gallons, viz. 144 Quarts, viz. 288 Pints, viz. 10152 Cubical Inches in a *Barrel*.

2. For *Ale-Measure*, the *Pint*, *Quart*, and *Gallon*, are as the same in *Beer-Measure*; But there are allowed but 8 Gallons to the *Firkin*, 16 to the *Kilderkin*, and only 32 to the *Barrel*; so that a *Barrel* of *Ale* is to hold but 128 Quarts, viz. 256 Pints, viz. 9024 Cubical Inches.

3. In *Wine-Measure*, there are but 29 Cubical Inches in a *Pint*, 2 Pints to a *Quart*, 4 Quarts to a *Gallon*, 18 Gallons to a *Rundlet*, three *Rundlets* and an half, or 63 Gallons make an *Hogshead*; one *Hogshead* and a third part of an *Hogshead*, that is to say, 84 Gallons, make one *Tercion* of *Wine*, that is the third part of a *Tun*, a *Tercion* and an half,

or

or 126 Gallons make a Pipe, or Butt, and
2 Pipes or Butts a Tun of Wine, which
contains 252 Gallons, viz. 2016 Pints,
viz. 58212 Cubical Inches.

A Barrel for Soap is 31 Gallons.

Dry Measures.

THe Gallon for Dry Measures as Corn, &c. is
lesser than the Beer and Ale Gallon, and
greater than the Wine Gallon, containing 272
Cubical Inches and a Quarter, and divided into
Pottles, Quarts, and Pints, as aforesaid.

Two of these Gallons make a Peck.

Two Pecks a Tover, or Half Bushel.

Two Tovers, or 8 Gallons, a Bushel.

4 Bushels a Strike, or Coom.

2 Strikes a Quarter.

Of Weights.

I. Of Apothecaries Weights, and their
Characters.

Thus markt.

A Grain——gr. the least Measure or Weight
of a Barly-Corn.

A Scruple—— $\mathfrak{z}$ Contains 20 Grains.

A Dram—— $\mathfrak{z}$ is 3 Scruples.

An Ounce —— $\mathfrak{z}$ is 8 Drams,

A Pound—— $\mathfrak{lb}$ Contains 12 Ounces.

$\mathfrak{s}$ *Semis* Half.

Some

Some other things used by Physicians, Chymists,
 &c, and their Marks.

An Handful [*Manipulus*] thus noted—M.

A Pugil being as much of Herbs or the like, as
 can be taken up at once between a Fingers and
 one's Thumb, is thus marked—P.

Ana [that is as much as to say, of Each] A. or
 Ana.

Recipe, Take thou—R.

Semissis [half] is.

Tartar ———— ☐

Sal ———— ⊖

Sulphur ———— △

Antimony ———— δ

Vitriol ———— ⊖

Our other Common Weights are Two-
 fold.

1. *Troy Weight*, whereby Bread, Gold, Silver,
 Apothecaries wares, as aforesaid, &c. are
 weighed : Containing only 12 Ounces in the
 pound, Each ounce 20 Penny-Weight, Each
 penny-weight 24 Grains. This seems to
 have been the Ancientest Weight by its
 Name, as derived from the Famous City of
 Troy, from whence Brute and his People
 are said to have descended, and to have
 Called London, *Troy-Novant*, or *New-Troy*:
 which whether true or fabulous, yet it
 may be a good Argument, that this sort
 of Weight, is at least of very ancient use
 amongst us.

2. The

2. The second and more common Weight, is called *Averdupois*, which being *French*, is in English, *Have your weight*; signifying to be a fuller and larger Weight than the other; for it contains 16 Ounces, or 128 Drains, viz. 384 Scruples, viz. 7680 Grains: by this, is weighed all kinds of Grocery ware, and inferior Metals, as Iron, Copper, and Brass, as also Hemp, Flax, Rosin, Pitch, Tarr, &c. A Great Hundred is not exactly what it seems to be by the word, but 112 l. so the Half Hundred 56 pounds, the Quartern 28, and the Half Quartern 14 pounds.

Wooll Weights.

A Stone 14 pounds.

A Tod 20 pounds.

A Sack is 26 stone, that is 364 pounds.

Cheese Weights.

A Clove of Cheese is 8 pound.

A Wey of Cheese 32 Cloves, that is 256 pounds, viz. Twelvescore and 16 pound.

And so much weigheth the Wey of *Suffolk* Cheese, and the like is, or should be, the Barrel of *Suffolk* Butter.

But the Wey of *Essex* Cheese is but sixscore and sixteen pounds, and their Barrel of Butter the same.

Herrings are allow'd 120 to the Hundred, and ten Thousand of them are called *A Last*.

Characters

The second and more common Weight is called *Weight*, which being mixed, is in English and larger Weight than the other.

Characters in Astronomy.

The Planets,

The Signs

Saturn ——— ♄	Aries ——— ♈	Libra ——— ♎
Jupiter ——— ♃	Taurus ——— ♉	Scorpio ——— ♏
Mars ——— ♂	Gemini ——— ♊	Sagittarius ——— ♐
Sol ——— ☉	Cancer ——— ♋	Capricorn ——— ♑
Venus ——— ♀	Leo ——— ♌	Aquarius ——— ♒
Mercury ——— ☿	Virgo ——— ♍	Pisces ——— ♓
Luna ——— ☾		

The Dragons Head ♁

The Dragons Tail ♂

Part of Fortune ☿

The Aspects New and Old.

Names.	Characters.	Distance.
Conjunction	♄	0 — 0 — 00
Vigintile	Vig	0 — 0 — 18
Quindecile	Qd	0 — 0 — 24
Semisextile	ss	1 — 0 — 00
Decile or Semiquintile	Dec	1 — 0 — 06
Semiquadrate, Octile or } Sesquidrate	Sq	1 — 1 — 15
Sextile, Hexagone	*	2 — 0 — 00
Quintile	Q	2 — 1 — 12
Quadrate, Square, or Quartile	□	3 — 0 — 00
Tredecile, or Sesquiquintile	Td	3 — 1 — 18
Trine	△	4 — 0 — 00
Sesquiquadrate	Ssq	4 — 1 — 15
		Biquintile

Biquintile	Bq	4	24
Quincunx, or Quadrasextile	Vc	5	00
Opposition	8	6	00

G. or Gr. in Latin, 3 Degrees, or the 30. part
and D. or Dr. in English, 3 of a Sign. See Degree

M. Minutes thus markt, ' or the 60th part of
a Degree.

S. or Seconds thus markt, " or the 60th part of
a Minute.

Thirds thus markt "' the 60th part of a Second,
and so on to Fourths, &c.

R. Retrograde; Dir. Direct, Or. Oriental,
Occ. Occidental, M. A. Meridional or South-
Ascending, M. D. South-Descending, S. A. Sep-
trientrional or North-Ascending; N. D. North-
Descending.

Signs.

Signs, or Symbols now commonly used by some Algebraical Writers.

$=$ Is the Sign of Equation, and signifies Equal to. As $A = B$. Is A. equal to B.

$\succ$ Is the Sign of Majority, and signifies Greater than, As $A \succ B$. Is A greater than B.

$\prec$ Is the Sign of Minority, or Lesser than, As $A \prec B$. Is A Lesser than B.

$+$ Is the Sign of Addition, and signifies more As $A + B$. Is more A. more B. yet sometimes the Sign of the foremost Quantity is left out, As $A + B = A + B$, That is more A. more B. Is equal to more A more B.

$-$ Is the Sign of Subtraction, and signifies Less, As $A - B$. Is A less B

$\times$ Is the Sign of Multiplication, and signifies Multiplied by, As $A \times B$. Is A multiplied by B.

The Signs of Division is a Line drawn Level between two or more Quantities, As

$$A + B \div C$$

———— which is thus to be read,

D

A more B. less C. Divided by D. or sometimes

times thus D) $A + B - C$. that is, D.
Dividing A more B, less C.

$\equiv$ Is the Sign of Continuation, As A, B, C,
D, E, $\equiv$ shows that these Quantities
are in Continual Proportion.

$::$ Is the Sign of Interruption, and denotes
the middle of 4 Proportionals interrupt-
ed, As A. B. $::$ Y. Z. Is thus read As A.
to B. so is Y. to Z.

() A Parenthesis, with a power note in it,
signifies Involution: As $A, - B$. (2) Is
the square of A less B. or $A - B$. (3) Is
the Cube of A. less B.

$\sqrt{\quad}$ A Radical Sign with an Index in it, signifies
Evolution, as $\sqrt{A - B}$. Is the Square Root
of A less B. or, $\sqrt[3]{A - B}$: Is the Cube
Root of A less B. But through an Irregu-
lar Custom $\sqrt{\quad}$, is usually taken for a
Square Root.

A Cata-

A Catalogue of GLOBES, Celestial and Terrestrial, Spheres, Maps, Sea-Plats, Mathematical Instruments, and Books, made and sold by J. Moxon, at the Sign of Atlas in Warwick-Lane.

GLOBES 26 Inches the Diameter. The Price 20 *l.* the pair.

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SPHERES, according to the *Copernican Hypothesis*, both General and Particular, 20 Inches Diameter. Price of the General 5 *l.* of the Particular 6 *l.* of both together 10 *l.*

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Gunter's Quadrant 13 Inches Radius, printed on

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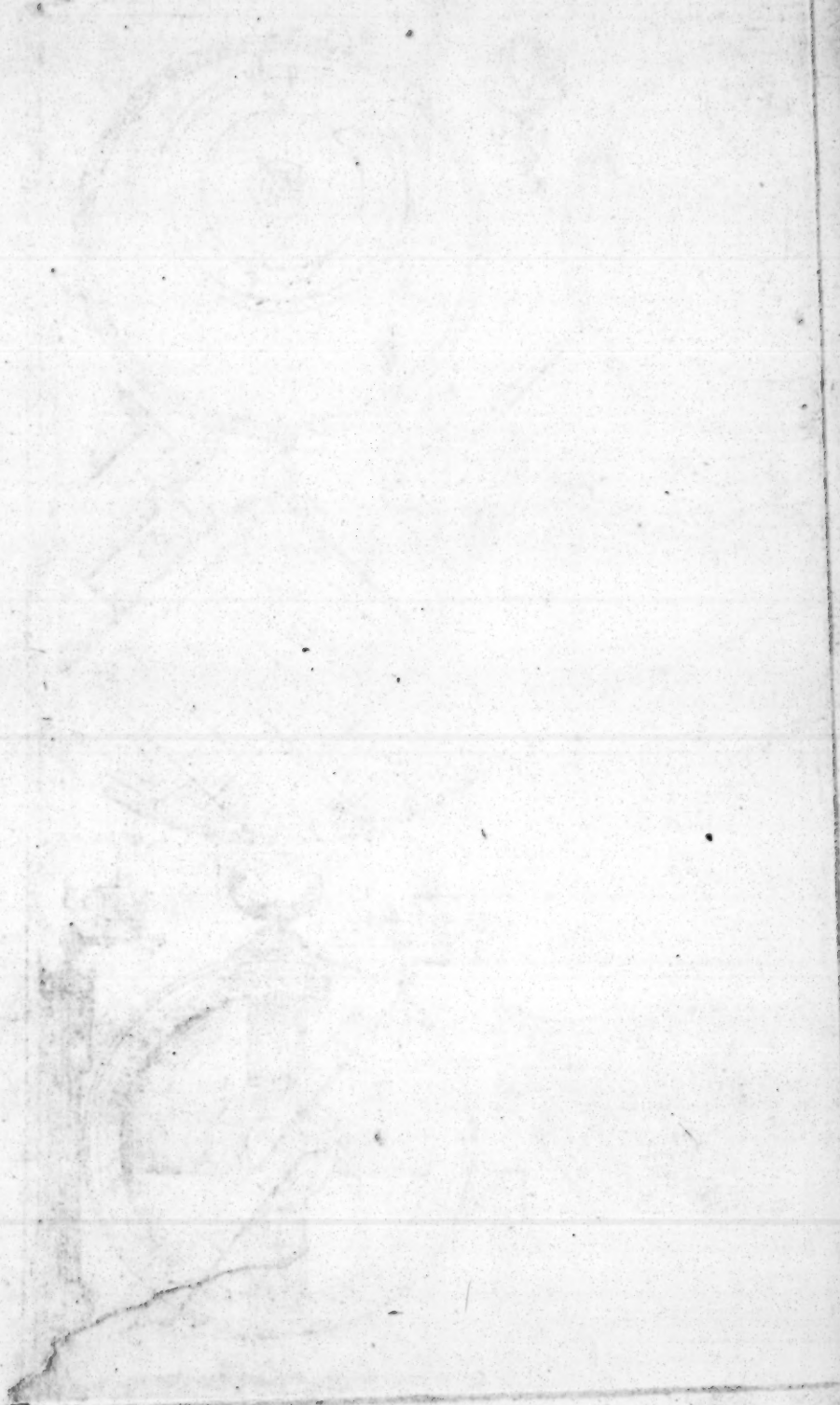
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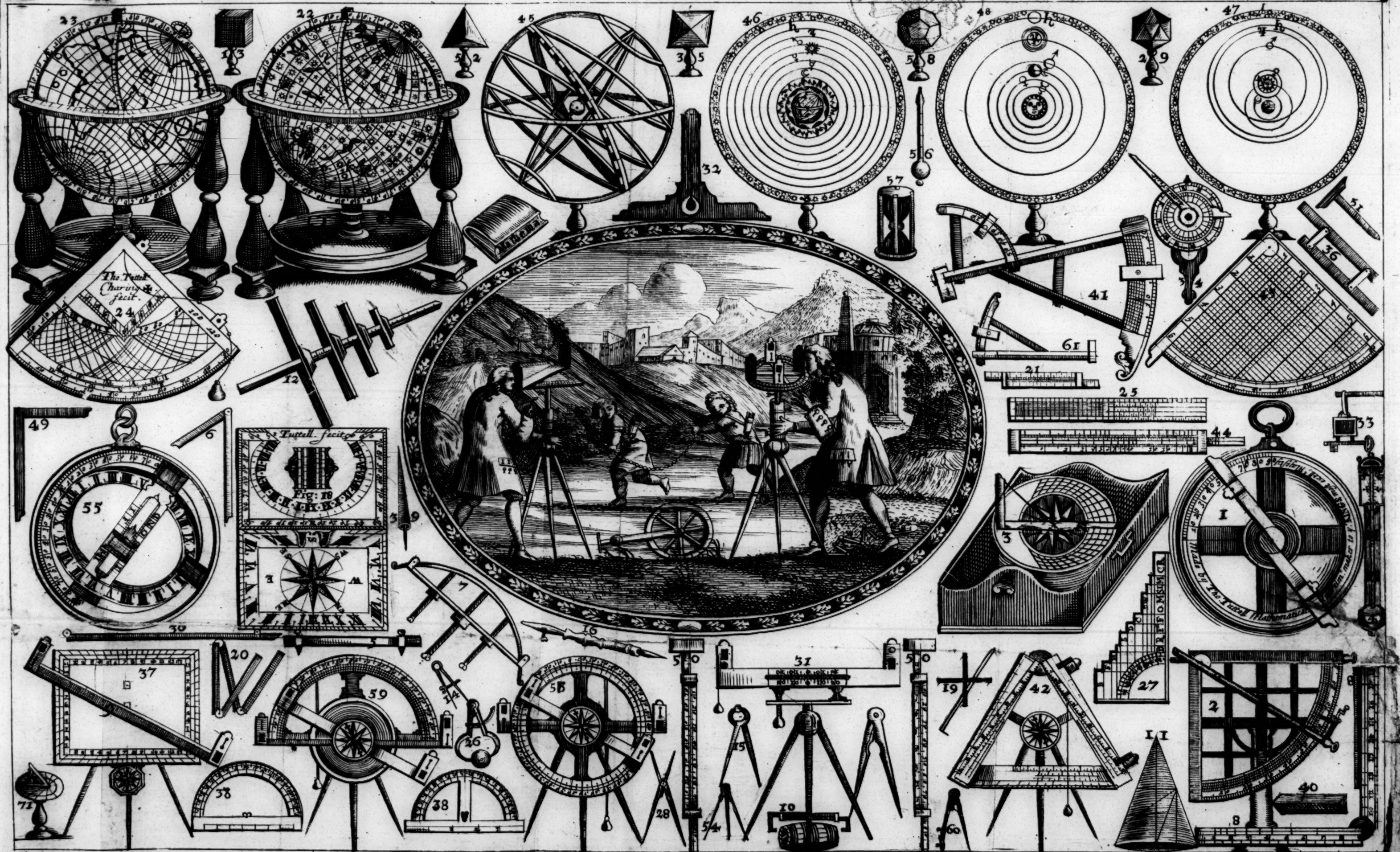
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PATENT OFFICE



A

A Lmacanther Staff, made of *Peartree* or *Box* with an Arch of 15 deg. to take Observations of the Sun, about the times of his Rising and Setting, *Fig. 61.* in Order to find the Amplitude, and consequently the Variation of the Compass.

Analemma, an *Orthographick* Projection of the *Sphere* upon the Plain of the Meridian, on Brass or Wood, with a moving Diameter or Index on the Center, divided by *Sines* (which may represent the *Horizon* of any place) upon which is fitted a Semidiameter piece that slides at right Angles divided by *Sines* also; very useful for solving most Propositions in the Doctrine of the Sphere.

Arithmetical Instruments, are many ways varied. One sort (invented by *Sir Charles Cotterel*, call'd visible Arithmetick) is made of many small thin pieces of *Ivory* or *Box*, with figures so Composed, that it performs Multiplication and Division, by Addition and Subtraction, and the Extraction of the Square and Cube Roots, and most Questions in Arithmetick with great ease; having in the Lidd of the Box a Contrivance of Beads or Wires to serve instead of Pen, Ink, and Paper, and to demonstrate Addition, Subtraction, &c. See the Book published by the permission of the Inventor.

See **Sliding Rules**, and what the several Authors say of the Application of them to Instru-

mental Arithmetick, See also *Papier's Bones*.

Astrolabe, a Circle made in Brass with an Index and sights, having one *Quadrant* divided into 90 deg. to take Altitudes. Fig. 1.

Astronomical Calendar, an Instrument curiously Engraven on Copper Plates, Printed on Royal Paper, pasted on a board; with a Brass Slider, which carries a hair, and shews by inspection the Suns Amplitude, Declination, Meridian Altitude, right Ascension, time of his rising and setting, &c. to greater nicety than the largest Globes now made.

Astronomical Quadrant, Sextant, &c. Instruments (generally very large) curiously fram'd, and the deg. exactly and minutely divided by the help of a Screw on the Edge of the Limb, fitted with Telescopes, on a strong Axis or Pedestals, with 2 Semicircles plac'd at right Angles on 2 endless Screws. which readily direct or guide the Instrument, to take Observations of the Sun, Moon and Stars. See the description in *D. Hookes Works*. F. 2.

Azimuth Compass, made in a large Brass Box, with jambols and a broad limb having 90 degrees diagonally divided, with an Index and Thread to take the Suns Amplitude or Azimuth, in Order to find the difference between the Magnetical Meridian and the Suns Meridian, which shews the Variation of the Compass, Fig. 3.

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Air
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W
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B

Barometer, } An Instrument invented to
Baroscope, } Measure the Weight of the
 Air; now used, to shew whether Humidity or
 ficcidity doth most prevail in the Atmosphere: and
 from thence foretels (Mercury rising) Fair or
 Frost (Mercury falling) Rain, Snow or Wind.
 See the Learned *Boyle* and *Glanvil*. Now made
 so Portable, that 'tis applicable to take the Height
 of Mountains, Hills, Steeples, &c. and the depth
 of Caves, Wells, Mines, &c. Also much us'd
 to foretel Storms at Sea, Fig. 4.

Ball and Socket, made of Brass, with a per-
 petual Screw, to hold any *Telescope* or Instru-
 ment on a Staff for Surveying, Astronomy, &c.

Beam Compasses, an Instrument made in
 Wood, or Brass, with sliding Sockets to carry
 several shifting Points for large Projections, and
 much used for drawing the Furniture on Wall-
 Dials: by many Practical Artists, Fig. 5.

Bevel, an Instrument common to Builders,
 Carpenters, and Bricklayers, Fig. 6.

Bow, an Instrument made in Wood, former-
 ly used by Seamen, to take the Altitude of the
 Sun.

Bow, a Beam of Wood or Brass with 3 long
 Screws, that Govern or Direct a lath of Wood
 or Steel, to any Arch: used commonly to draw
 Draughts of Ships, Projections of the Sphere,

or wherever 'tis requisite to draw large Arches, Fig. 7.

Bricklayers Rules, generally made of Box, 2 Foot or 18 Inches Long, with a Joynt to fold, and Lines properly adapted to Measure Brick-Work, Fig. 8.

C

Carpenters Rules, made of Box, 2 Foot or 18 Inches long, to shut with a Joynt, with Timber and Board Measure, *Gunters* line Inches, and Foot Measure, Fig. 8.

Chains, made for surveying of good hard Wire, according to *Rathborn, Leiborne, Wing, &c.* see *Gunters Chain* also.

Charts, are Draughts projected for the use of Seamen, much Corrected by our Modern Artists, which discover the Shelves, Sands, Rocks, &c. Clearly explain'd by all Navigation Authors.

Circumferentor, an Index and sights of Wood, or Brass, Fig. 9. with Box and Needle, and Ball and Socket, fitted to a 3 Legg'd Staff, for surveying: also a Label, Fig. 29. with a Tangent Line, on the Edge of the Index, to take Altitudes, generally used to take the bearings, very fit to survey large Mannors, Counties and Lordships.

Callipers, made like a sliding Rule, to embrace the 2 heads of any Cask, to find the Length. Fig. 10. See *Gunters Callipers*. Fig. 26.

Compass

Compass, the 32 Winds or Points, drawn on a Chard with a Brass Cap, fitted in the middle to hang tenderly on a Point, and a piece of thin Iron or Steel, fitted under the Meridian, or *North*, and *South* Line, which being touched on the 2 Poles of a Loadstone, always Direct themselves to the Magnetical Meridian, viz. nearly *North* and *South*, the difference is called the Variation of the Compass, see *Azimuth Compass*. is fitted in Brass, or Wooden Boxes, in Jambols or Hoops of Brass, with a Weight at the bottom, so that in all motions of the Ship the Chard or Fly, hangs always Level. This Instrument has mightily improved Trade and Navigation: the Compass is also very useful in Surveying, Dialecting, and many other parts of the Mathematicks.

Compass Dial, fitted in Boxes for the Pocket, that shews the Hour by the Direction of the Needle.

Compasses of Proportion, to divide Lines and Circles into proportional Parts at one opening of the Compasses, Fig. 28. very much used in reducing, or enlarging of Maps, or Draughts, improved by adding, removing, or shifting points.

Cone, made in Box, and cut into the several Sections, called *Parabola*, *Hyperbola*, *Ellipsis*, *Triangle* and *Circle*, Fig. 11. the knowledge whereof is useful in drawing the Furniture on Sun-dials, &c.

Cross-staff, made of Box or Pear-tree, commonly called a Fore-staff, because of taking forward Observations; and may be made also a

Back-staff, by adding a forth Vein and sight used by Seamen, to find the Meridian Altitude of the Sun or Stars, in Order to find the Latitude, also used in Surveying to take Angles, Fig. 12.

Cube, a regular Solid (one of the 5 Platonick Bodies) contained under 6 Square Planes for Dials, Fig. 13. sometimes cut into proportional Parts, to Demonstrate the Nature of the Square and Cube Roots.

D

Dark Tent, a Box made almost like a Desk with Optick Glasses, to take the Prospect of any Building, Fortification, Land skip, &c.

Declinatoryes, a Pear-tree Box with a Compass and Needle, to take the Declination of Walls for Dialling, &c.

Draught Compasses, with several removing Feet to draw fine Draughts of Charts, Maps, &c. Fig. 6.

Dividers, are like a pair of Compasses, generally made in Steel, only confined by the help of a Screw to be more steady in small Operations Fig. 14. sometimes a pair of Brass Compasses Fig. 15. (call'd Platts) are used by Seamen, on Charts and Maps, as Dividers.

Dodecahedron, A Solid Figure contained under twelve equal Pentagons (one of the 5 Platonick Bodies) Fig. 58. sometimes fitted on a Pedestal with Dials drawn on every Plain, the

Dire

D

direct one another to shew the true Hour of the Day.

Drawing-Table, with a Frame to hold a sheet of Royal Paper, for draughts of Ships, Gardens, and Fortifications.

Drawing-Pen, made with a pair of steel chops, governed by a Screw to draw lines finer or grosser, Fig. 16. also made to draw 5 or 6 lines together for Musick Books.

Dials, variously made; but the most ornamental and useful are graduated on large plates of Brass fix'd on Pedestals, Fig. 17. for the Gardens of the Nobility and Gentry, to set, examine, and adjust their Clocks and Watches. These sort of Dials are sometimes small for a Post or a Window.

Dialling Globe, made of Brass or Wood with a plane fitted to the *Horizon*; an Index, particularly contrived to draw all Sorts of Dials, and to give a clear demonstration of that Art.

Dialling Sphere, made of Brass, with several Semicircles sliding over one another, on a moving *Horizon*, to Demonstrate the Nature of the Doctrine of Spherical Triangles, and gives the true *Idea* of the drawing Dials, on all manner of Planes.

E

Elliptical Dial, made in Brass or Silver, with a Joynt to fold together, and the Gnomons to fall flat- Commodiously contrived

to take little room in the Pocket, and is preferable to most other Sun-dials, because it finds the true Meridian Hour of the Day, Rising and Setting of the Sun, and many other Propositions of the Globe, depending wholly on it self, Fig. 18. See *Tuttles* use.

Elliptical Compasses, made in Brass, to draw at one Revolution of the Index any Ellipsis or Oval, Fig. 19

F

F **Dye and Back-staff**, See Cross-staff, Fig. 12

G

G **Gauging Rod**, commonly made with 3 Joynets, with a Semicircle to take Diameters: see also the several sliding Rules, and the Application of them by the several Authors, to the Art of Gauging, Fig. 20.

Glassiers Rules, made of 2 Pieces of Box that slide by one another, with lines well contrived for their Work, Fig. 21.

Globes, Cœlestial and Terrestrial, in brass Meridians (with a Quadrant of Altitudes,) commonly

monly fitted in Walnut tree Frames Fig. 22. 23. being an easy Introduction to Geography and Astronomy; sometimes on a Pedestal only: fitted also in Cases for the Pocket. See use of the Globe.

Gunter's Quadrant, made in Wood or Brass, Curiously contrived to find the Hour and Azimuth, and most Propositions of the Globe: also, the Height of Trees, Steeples, &c. See a small Tract of its use, Fig. 24.

Gunter's Chain, made of Hard Wire, being 4 Poles in 100 Links, with Brass distinctions at every 10 Links, of Excellent use in Surveying of Land to the easy and speedy finding the Contents in Acres.

Gunter's Scale, made commonly of Box 2 Foot Long, with Numbers (called *Gunters Line*) and Sines and Tangents, with Chords, Rhombs, Leagues, Longitude, and equal Parts, Inches and Foot Measure, and a double Diagonal Scale, &c. Particularly useful in Navigation, and likewise in most parts of the Mathematicks, Fig. 25.

	Rules,	To find
	Quadrants,	} the Diame- ter of the Ball & Bore of the Gun, strength and
Gunner,	Callipers Fig. 26.	
	Powder tryals,	
	Heights,	
	Mouth pieces Fig. 27.	
Weight of Powder, Weight of Shot, length of Ladle, Elevation of the Piece and many other requisites.		

H

Half and whole *Compasses*, made of *Brass*, with *Steel Joynts*, used to enlarge or diminish *Draughts*, or *Maps*, so that to whatever distance you open the long Points, the other gives you the just half, Fig 28.

Hemispheres, Prints of the *Heavens*, pasted on a *Board*. See a *Book* of their use.

Horse Measures, commonly a *Rod* of *Box* to slide out of a *Cane* with a *Square* at the end, and Divided into *Hands* and *Inches*, to measure the *Height* of *Horses*.

I

Icosahedron, A Solid Figure (one of the 5 *Platonick Bodies*) contained under Twenty equal and equilateral *Triangles*, Fig. 29. used commonly on a *Pedestal*, for variety of *Dials* on each plain, that Direct themselves to shew the true Hour.

Imperial Table, made of *Brass*, with *Box* and *Needle*, and *Staff*; useful to measure *Land*, and particularly described, with a large *Copper cut*,
by

by the Contriver Mr. *John Wing*, in his late
Book of Surveying.

L

L *Level*, A long thin brass Ruler with a small sight at one end, and a Center hole at t^other, commonly used with a Tangent Line, on the Edge of a Circumferentor, to take Altitudes, Fig. 30.

Leavel, made of Wood or Brass, with 2 sights and a Glass, almost fill'd with Spirit of Wine, with a Cover divided into several equal parts, whereby to adjust the bubble, with a Sprang to fit it to a 3 Leg'd Staff, and a long Screw to rectifie the Bubble by the help of a Plummer, that hangs on one of the sights, Fig. 3. Sometimes instead of the long Screw, and Sprang we fit a Rack, being 2 Semicircles at right Angles, with a Thread or Worm, upon 2 Endless Screws, which with a Key readily brings the Instrument to a true Leavel; and sometimes to help the sight we add *Telescopes*. Formerly this Instrument was made with a Hollow Tube, and 3 Cups to be fill'd with Water (from thence called a Water-Leavel) but is not found so useful as before mention'd: to this Instrument belongs two Station-Staffs (see Station-Staff) Fig. 50. used by *Ingineers*, Surveyors, and other Artists to find the true Leavel, for Conveying Water to supply Towns, making Rivers Navigable, unwatering

tering Fens, dreining Boggs, &c.

Leavel, made of Wood with an upright piece to hold Thread and Plummer, Fig. 32 used by Builders.

M

Magnet, or Load-stone Armed with 2 Iron sides, that embrace the *North* and *S* *out* Poles, which so mightily increases the Vertue or Power, that 'tis much more useful for touching Compasses, Needles &c. Fig. 33.

Micrometer, an Instrument made of Brass, with a Movement and a plate or face divided like a Clock or Watch, with an Index or hand, which (being turned) moves two Sliding Plates of Brass with hairs, and counts on the Plate the revolves or Turns of the endless Screw. This Instrument is fitted to a large *Telescope*, and used in Astronomy to find the Diameters of Stars.

Mine-dial, a Box and Needle with a brass Ring, divided into 360 degrees, with several Dials Graduated thereon, generally thus made for the use of Miners.

N

Napier's Bones, are numbering Rods made of small slips of Box or Ivory in a small Box

Box for the Pocket, which performs Multiplication by Addition, and Division by Subtraction. used to answer several Questions in Arithmerick. See the *Book* of its use.

Recturnal, an Instrument made of Box or Ivory, Divided on both sides to take the Altitude or depression of the Pole Star, in respect to the Pole it self, in Order to find the Latitude and nearly the Hour of the Night, Fig. 34. see its Explanation in most *Books* of Navigation.

O

Octahedron, A regular Solid (one of the 5 Platonick Bodies) contain'd under Eight Triangles, Fig. 35. used on a Pedestal, to draw various sorts of Dials.

Oughred's double Horizontal Dial, made of Brass, with a double Gnomon, one to shew the Hour, on the outward Circle, the other to shew the same Hour in the Stereographick Projection. (drawn on the Plate) This not only finds the Meridian and Hour, but shews the Suns place, rising and setting, Declination, Amplitude, Altitude, and Azimuth, Diurnal Arch and many other useful Propositions, and very well apply'd to the making of Dials. See *Book* of the use, or *Oughreds Circles* of Proportion, Fig. 17.

Parallel Ruler, made in brass or Wood to draw Lines parallel to each other: of great use in Fortification, Architecture and many other parts of the Mathematicks. Fig. 36.

Parallelogram, made of 5 Rulers of brass or Wood, with Sockets to slide or set to any proportion; used to enlarge or diminish any Map or Draught: used in Fortification, Building and Surveying.

Parallelogram Protractor, A Semicircle of Brass with 4 rulers, in form of a Parallelogram; made to move to any Angle; one of which Rulers is an Index which shews on the Semicircle the Quantity of any inward or outward Angle.

Perambulator, (or Walking Wheel) made of Wood or Iron, commonly half a Pole in Circumference, with a movement and a face divided, like a Clock with a long rod of Iron or Steel, that goes from the Center of the Wheel to the Work. There are two Hands which (as you drive the Wheel before you) count the Revolution, and from the Composition of the Movement, and by the divisions on the Face shew how many Yards, Poles, Furlongs and Miles you go. A very useful Instrument speedily to measure Roads, Rivers and all level Lands: sometimes we make them to answer according to all foreign Measures.

Plain Table, An Instrument commonly made of Walnut tree, with a box Frame large enough to strain a sheet of paper; one side divided in-

to 360 Degrees, the other side divided into 180 Degrees, with equal parts on each side (to draw Parallels) to the Table is fitted a Box and Needle with a brass Ring divided into 360 deg. and the Points of the Compass drawn on a Plate of brass at the bottom, with a brass Sprang to fit a three legg'd Staff Fig. 97. There is also a brass Index and sights, not only to cut the degrees on the Plain Table, but fitted to the Box and Needle, to serve with a Label as a Circumferentor. Thus fitted it performs as the Theodolite Semicircle Circumferentor. See *Holvel, Leyborne,* and *Wing's* Surveying.

Plain Scale, made of box, a foot long, with a double Diagonal Scale, Sines, Tangents, Secants, Chords, Rhombs, Leagues, Longitudes and Equal parts: used by Seamen to solve their questions in Plain Sailing and to save their *Gunter*.

Plow, made of box or Pear-tree; used by Seamen to take the height of the Sun or Stars, in order to find the Latitude: it admits of the Degrees to be very large, and is greatly esteemed by many Artists.

Protractor, A thin Semicircle of brass or Silver, containing 180 Degrees diagonally (which is accounted the best way) or otherwise subdivided, figured both ways by 10, 20 to 180, and back again by 190, 200 and so to 360, Fig. 38. Some Artists will have 180 degrees graduated on a Parallelogram or long square in the nature of Tangents, and use it to draw Parallel Lines from the opposite degrees and parts; sometimes (for young Students) we make a Protractor, a whole Circle containing 360 Actual Degrees. These Instruments are used by Surveyors, Engineers,

gineers and others, speedily to protract or lay down any Map or Draught upon Paper, or wherever it is needful to measure or make any Angle.

Protracting Pin, A taper piece of brass with a Point of Silver, to draw black Lines on Mathematical Paper, and a small Head to screw out and turn in, which holds a fine Needle to prick off any Degree and part from the Protractor, Fig. 39.

Prisme, made commonly of box, and cut into 3 Pyramids. Fig. 40.

Q

Quadrant, made of brass, with ball, and socket and staff to take Altitudes, and used in Surveying, but somewhat tedious and troublesome where the Angles are more then 90 degrees.

Quadrant's, (call'd frequently *Davis's* Quadrant and Sea Quadrant) made of Box Pear-tree, or Ivory, composed of two Arches; the lesser Arch containing 60 actual Degrees, and the large Arch 30, which make a Quadrant (or 90 Degrees) diagonally divided into ev'ry minute of a Degree, with 3 Veins or Sights: the great Arch conveniently plac'd for the advantage of sight, the lesser for the advantage of the shadow. This Instrument is used by Navigators to take the Meridian Altitude of the Sun, in order to find the Latitude Fig. 4. sometimes we make the

the large Arch to contain but 25 degrees, and the lesser Arch but 65. degrees, for conveyance of Carriage.

R

Reducing Scale, commonly understood a thin broad piece of Box with several different Scales of equal Parts, and Lines to turn Chains and Links into Acres and Roods, (by inspection) used by Surveyors, to reduce any Map Draught. Sometimes 'tis called a Surveying Scale.

S

Sector, made of Silver, Brass, Ivory, or Wood of all Sizes, and framed with a curious joint (formerly called a French joint) much improved in the contrivance and performance; with a piece to turn out to make a true Square, Lines from the Center are Sines, Tangents, Secants, and other Parts, Rhombs, Polygons, Metals, Solids, Surfaces, Hours, Latitudes; &c. Generally useful in all the practical Parts of the Mathematics. Fig. 42. and particularly contrived for Navigation, Surveying, Dialling, Astronomy, Projection of the Sphere, &c. by Gunter, Foster, Collins, and others; likewise for Fortification and Gunnery,

B b

(by

(by Sir *Jonas Moor*) see his description and use of This Instrument, for its Numerous uses and easiness of carriage, bears one of the greatest Characters among Mathematical Instruments, and also well applied to practical Mathematicks, by several Foreign Authors.

Sciathericum Telescopicum, an Horizontal Dial with a Telescope, adapted for observing the Moment of time, by Day or Night, to regulate and adjust Pendulum Clocks, Watches, and other time Keepers. See *Molynæus*, of the use with a Copper Cut of the Instrument.

Scamozzi's Rule, A 2 Foot joint Rule, well Work properly adapted for the use of Builders. See his Book of Architecture.

Semicircle, made of Brass, with an Index and sights, Box and Needle, Ball and Socket, and Staff, containing 180 Degrees, being half of a Circle. See Theodolet (See Theodolet.)

Serle's Scale, in Wood or Brass, with Lines Ingeniously adapted to the Art of Dialling. See *Serle's Book of Dialling*.

Sinical Quadrant, made of Brass or Wood, which by the Sines drawn from each side intersecting one another with an Index, divided into Sines also, with 90. Degrees on the limb, and sights on the Edge, to take the Altitude of the Sun. Sometimes (instead of Sines) we divide into equal Parts. Used by Seamen to solve (by Inspection) any problem of plain Sailing, and Questions in Astronomy, Fig. 43.

Sliding Gunter, made of Box, with a middle piece that slides between 2 pieces, with Lines to answer Proportions by inspection: chiefly used by Mariners, Fig. 44. See *Gunter's Scale*.

Sliding Rules, for gauging and measuring: ingeniously contrived and applied by *Partridge*, *Washall*, *Everard*, *Hunt*, and others, who have wrote particularly on each. See their several books.

Sliding Rule, in a Cane; fittly applied to the use of gauging, by Mr. *Everard*.

Sphere, made of Silver or Brass Hoops, or Rings, representing the Principal Circles of the Sphere (called a material Sphere) Fig. 45. or according to the Systems of *Ptolomy*, Fig. 46. *Nicho Brahe*, Fig. 47. and *Copernicus*, Fig. 48. See a Book of the use of the Globes,

Square, made of Brass or Wood, having one side perpendicular, or at right Angles to the other: sometimes made with a joynt to fold (for the Pocket) and sometimes has a back to use on a Drawing Board, or any thing that has the Edges very strait to guide the Square, Fig. 49.

Station-staff, made of 2 Rulers that slide to and fro on a Foot, divided into Feet and Inches, with a moving Vein or sight, two of which are used with a Leavel, and on the edges we divide the Links of *Gunter's Chain*: used in Surveying for the more easie taking off Sets, Fig. 50.

T

T **See**, a double Square in the form of a T, Fig. 5. See Square.

Tan foot Rods, See Station-staffs.

Tetrahedron, A Regular Solid (one of the 5 platonick

nick Bodies) contained under 4 Triangles, Fig. 52. fitted on a pedestal with Dials.

Theodolite, a whole Circle made of Brass containing 360 degrees, diagonally or otherwise divided, with an Index, and sights moving on the Center, and a box and Needle in the middle having a Brass Ring divided into 360 degrees, and the points of the Compass drawn on the bottom, with a Ball and Socket, fitted on a staff to take heights and Distances. This is approved as an Excellent Instrument for Surveying; some will have Telescopes instead of sights, Fig. 53.

Thermometer, a Spirit glass fitted in a frame to a scale which by rarefaction and condensation, shews all the unperceivable alterations of the Air, as to Heat and Cold, used in Green Houses, Bagnios, &c. A great help to frame the true History of the Weather, See the Learned *Boyle*, *Glanvil*, *Dr. Goad* and others.

Triangular Quadrant, being a Sector (see Sector) with a loose piece to make it an Equilateral Triangle, and has the Kalendar graduated on it with the Sun's place, Declination; and many other useful Lines, and has two Quadrants, 180 degrees on the Edge, and used with a Telescope, or sights to take Observations of the Sun or Stars, by the help of a Cross piece that has sprang to fit it to a Ball and Socket, and sometimes with an Index and sights: used for Surveying. Some Artists will have Veins fitted and use it in Navigation. It is an excellent Instrument ingeniously contrived to be very portable, and of great use in the Art of Dialling, Fig. 42. See *Brown's Book* of the use.

Triangular Compasses, containing 3 Legs or Feet, to take off at once any Triangle: used on Maps, Globes, &c.

Three Leg'd Staff, made with Joynts to shut together, and take off in the middle for the better carriage: to support Instruments for Astronomy, Surveying, &c.

U

Universal Equinoctial Dial, made of 2 Rings of Brass or Silver, that open and fold together with a bridge or Axis, and a slider, with little Rings to hang or hold it by, divided on one side of the great Ring into 90 degrees, and 2 Quadrants, or 180 degrees on the other, and 24 Hours subdivided on the face and inside of the lesser Ring: the Axis has the Suns Declination and Kalendar, according to the Old and New stile; this Dial finds the Latitude and Hour of the day and most propositions on the Globe, Fig. 55. See *Tuttle's* use.

W

Waywiser, for the pocket; a movement, like a Watch to Number or count your steps or paces, in Order to find how far you walk in a day.

Waywiser, for Chariots; to shew how far your Coach

Coach goes in a day: of the same Nature as the Perambulator only fitted to the great Wheel.

Waterposse, to try the strength of Liquors, Fig. 56. See Dr. Hooke's Works.

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